BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MARC SPITZER - Chairman
JIM IRVIN
WILLIAM A. MUNDELL
JEFF HATCH-MILLER
MIKE GLEASON

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR ADJUSTMENTS TO ITS RATES AND CHARGES FOR UTILITY SERVICE FURNISHED BY ITS EASTERN GROUP AND FOR CERTAIN RELATED APPROVAL	DOCKET NO. W-01445A-02-0619 **NOTICE OF FILING OF STAFF'S SURREBUTTAL TESTIMONY**

Staff hereby provides Notice of Filing its Surrebuttal Testimony in this Docket. An original and thirteen copies of the Surrebuttal Testimony of Joel M. Reiker, John S. Thornton, Jr., Ronald E. Ludders, and Lyndon R. Hammon will be filed with Docket Control. Additionally, the applicant and all intervenors will receive a copy by mail.

RESPECTFULLY SUBMITTED this 3rd day of September, 2003.

Timothy J. Sabo
Gary H. Horton
Attorneys, Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007
(602) 542-3402

The original and thirteen (13) copies of the foregoing were filed this 3rd day of September, 2003 with:

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Copies of the foregoing were mailed this 3rd day of September, 2003 to:

Ralph J. Kennedy
Vice President and Treasurer
Arizona Water Company
P. O. Box 29006
Phoenix, Arizona 85038-9006

Robert W. Geake, Esq.
Vice Pres. and General Counsel
Arizona Water Company
P.O. Box 29006
Phoenix, AZ 85038-9006

Norman D. James, Esq.
Jay L. Shapiro, Esq.
Fennemore Craig
3003 North Central Ave., Suite 2600
Phoenix, AZ 85012
Attorneys for Arizona Water Company

Scott S. Wakefield, Esq.
RUCO
1110 West Washington, Suite 220
Phoenix, Arizona 85007

Kay Bigelow, Esq.
City of Casa Grande
510 East Florence Boulevard
Casa Grande, Arizona 85222

Robert Skiba
P.O. Box 1057
Oracle, Arizona 85623

Thomas H. Campbell, Esq.
Lewis and Roca, LLP
40 N. Central Avenue
Phoenix, Arizona 85004
Attorneys for Superstition Mountain, LLC

Philip A. Edlund, Vice President
Superstition Mountain LLC
8777 N. Gainey Center Dr., Suite 205
Scottsdale, Arizona 85258

Nancy Roe
____

SURREBUTTAL

TESTIMONY

OF

JOEL M. REIKER
JOHN S. THORNTON, JR.
RONALD E. LUDDERS
LYNDON R. HAMMON

DOCKET NO. W-01445A-02-0619

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY FOR ADJUSTMENTS TO ITS RATES AND CHARGES FOR WATER UTILITY SERVICE

SEPTEMBER 3, 2003

BEFORE THE ARIZONA CORPORATION COMMISSION

MARC SPITZER
Chairman
JIM IRVIN
Commissioner
WILLIAM A. MUNDELL
Commissioner
JEFF HATCH-MILLER
Commissioner
MIKE GLEASON
Commissioner

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR ADJUSTMENTS TO ITS RATES AND CHARGES FOR UTILITY SERVICE FURNISHED BY ITS EASTERN GROUP AND FOR CERTAIN RELATED APPROVALS	DOCKET NO. W-01445A-02-0619

SURREBUTTAL

TESTIMONY

OF

JOEL M. REIKER

PUBLIC UTILITIES ANALYST V

UTILITIES DIVISION

SEPTEMBER 3, 2003

EXECUTIVE SUMMARY
OF THE SURREBUTTAL TESTIMONY
OF STAFF WITNESS
JOEL M. REIKER
ARIZONA WATER COMPANY
DOCKET NO. W-01445A-02-0619

The surrebuttal testimony of Staff witness Joel M. Reiker addresses the following issues:

Response to the rebuttal testimony of Company witness Thomas M. Zepp – Staff responds to the rebuttal testimony of Thomas M. Zepp.

Dr. Zepp's risk premium analysis is not valid.

Dr. Zepp cannot use corporate bond yields to imply meaningful equity risk premiums.

Dr. Zepp's response to Mr. Reiker's testimony regarding financial risk should not be given weight by the Commission. Dr. Zepp's assumption that the spread between the cost of Arizona Water's last bond issue and A-rated/AA-rated bonds is due to business risk is unreasonable. The likely cause of this spread is default risk or liquidity risk, neither of which increase Arizona Water's cost of equity. Dr. Zepp is not comparing apples to apples when he claims Mr. Reiker used the wrong measure of equity in his capital structure adjustment.

The Commission should not rely on the Fama-French three-factor model as Dr. Zepp proposes because it has not been widely accepted by the academic community, and a number of recent studies indicate that the model is not correct.

The soon-to-be published Zepp article contains fatal flaws and should not be relied upon to assume there is a small firm effect for utilities. There are several problems associated with Dr. Zepp's annual beta calculation. The Zepp article finds no fault with the findings of Wong. And the "new evidence" provided in the Zepp article has already been addressed by Staff in its direct testimony.

Dr. Zepp's claim that Staff's confidence interval is inappropriate to test the significance of the Zepp study is incorrect. Mr. Reiker explains why Staff's confidence interval is appropriate and provides examples showing that Dr. Zepp's paired difference test is not the appropriate test. Mr. Reiker shows that the preferred significance level for statistical testing is .05 or higher.

Dr. Zepp's extended version of the CAPM presented in his rebuttal testimony and his ad hoc risk premium approach are not preferred to the original CAPM. Dr. Zepp has not shown that CAPM tests using short-term Treasuries and raw betas can be appropriately applied to Staff's CAPM, which already produces required returns higher than what the original CAPM would produce. Dr. Zepp has not shown that a zero-beta CAPM, appropriately applied, would produce higher required returns than Staff's CAPM.

Dr. Zepp has not shown that investors ignore past or projected DPS growth, and he has not shown that past or projected DPS growth should not be used in a constant-growth DCF application for water utilities. Dr. Zepp's restatement of Staff's multi-stage DCF method should be given no weight by the Commission.

Mr. Reiker also responds to the rebuttal testimony of Company witnesses Ralph J. Kennedy and intervener Walter W. Meek.

TABLE OF CONTENTS

Page

INTRODUCTION 1

RESPONSE TO THE REBUTTAL TESTIMONY OF THOMAS M. ZEPP 1

Risk Premium Estimates 1
Bond Yield Comparison 2
Financial Risk 3
The Three-Factor Model 5
The Zepp Article 7
Dr. Zepp's Annual Beta *7*
New Evidence *11*
Wong Findings *12*
Differential Information *12*
The Zepp Study 13
The CAPM 17
Constant-Growth DCF Method 20
Multi-Stage DCF Method 23

RESPONSE TO THE REBUTTAL TESTIMONY OF RALPH J. KENNEDY 24

Liquidity Premium 24

RESPONSE TO THE REBUTTAL TESTIMONY OF WALTER W. MEEK 25

CAPM 25
Risk 27

CONCLUSION 28

INTRODUCTION

Q. Please state your name and business address.

A. My name is Joel M. Reiker. My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Are you the same Joel M. Reiker who previously filed direct testimony in this proceeding?

A. Yes.

Q. What is the purpose of your surrebuttal testimony?

A. The purpose of my surrebuttal testimony is to respond to criticisms of Staff's direct testimony contained in the rebuttal testimony of Thomas M. Zepp. I also respond to Company witness Ralph J. Kennedy and intervener Walter W. Meek.

RESPONSE TO THE REBUTTAL TESTIMONY OF THOMAS M. ZEPP

Risk Premium Estimates

Q. On page 22 of his rebuttal testimony Dr. Zepp criticizes Staff for not asking for his work papers. Did Staff and/or the Residential Utility Consumer Office ("RUCO") request copies of Dr. Zepp's work papers?

A. Yes. The parties in this case sent no less than four separate data requests asking for the Company's work papers (REL 1-29, REL 1-30, JMR 2-1, RUCO 1.19). For some reason the Company chose to withhold Dr. Zepp's Rebuttal Table 2 from Staff and RUCO until now.

Q. Does the work paper provided as Rebuttal Table 2 of Dr. Zepp's rebuttal testimony validate his risk premium analysis?

A. No, it does not. Dr. Zepp's first and second risk premium studies still assume that ROEs equal equity costs. On page 48 of Staff's direct testimony I described the problems associated with relying on ROEs authorized by regulatory commissions to estimate the cost of equity. Additionally, on page 54 of Staff's direct testimony I provided a quote from Professor Laurence Booth. Professor Booth stated in a *NRRI Quarterly Bulletin* article that "theoretically, there is no question whatsoever that a market-to-book ratio of 1.50 indicates that the [cost of equity] is less than the [allowed ROE]." Professor Booth has never come across a company witness who would disagree with that proposition.[1] The sample water companies have an average market-to-book ratio of 2.2 and the sample gas companies have an average market-to-book ratio of 1.7. Therefore, it is unreasonable for Dr. Zepp to assume that equity costs equal authorized ROEs in his first two risk premium studies, and it is unreasonable for Dr. Zepp to assume the water utilities in his first risk premium study have earned less than their costs of equity.

Bond Yield Comparison

Q. On pages 24 and 25 of his rebuttal testimony Dr. Zepp compares the rate on Arizona Water's series K bonds to the yield on A-rated and AA-rated bonds. He states that "If all water utilities have equity costs that are the same margin above their respective costs of debt ... the Company requires a risk premium that is at least 37 to 49 basis points above the benchmark costs of equity estimated for the water utilities sample." (See rebuttal testimony of Thomas M. Zepp. p. 25 at 7 – 10.) Does Staff agree?

A. No. As stated on pages 48 and 49 of Staff's direct testimony, the yield on corporate bonds cannot be meaningfully compared to the cost of equity. This is because corporate bonds contain some default risk which is diversifiable. On page 49 and Chart 5 of Staff's direct testimony I reported the historical yield spread between Aaa-rated and Baa-rated corporate

[1] Booth, Laurence. "The Importance of Market-to-Book Ratios in Regulation." *NRRI Quarterly Bulletin*. Winter 1997. pp. 415 – 425.

bonds. This yield spread also exists within individual bond rating categories. Different companies have different perceived levels of default risk, and because some of this default risk is diversifiable (unsystematic) it is irrelevant to the cost of equity. That is why Professor Booth states that all risk comparisons should be to default-free government bonds.[2] Richard Brealey of the London Business School and Stewart Myers of M.I.T discuss this concept on pages 561 and 562 of their text Principles of Corporate Finance (third edition).

Financial Risk

Q. On pages 28 and 29 of his rebuttal testimony Dr. Zepp gives three responses to Staff's testimony that Arizona Water is less risky because it has less financial risk than the sample companies. His first response is to repeat his observation that Arizona Water's last bond issue had a cost that was higher than the cost of A-rated and AA-rated corporate bonds. He states that "the most obvious answer is that Arizona Water has additional business risk that more than offsets its lower financial risk." (See rebuttal testimony of Thomas M. Zepp. p. 28 at 26 and p. 29 at 1 – 2.) Does Staff agree?

A. No. Staff does not agree that the most obvious cause of a yield spread is business risk. As previously discussed, the most obvious factor affecting a yield spread would be the probability of default.

Q. Are there other reasons for a private bond placement to have a cost that is higher than the cost of corporate bonds?

A. Yes. Professor Frank Reilly of the University of Notre Dame and Professor Keith Brown of the University of Texas explain why a private placement may have a higher cost than a public offering in their 2003 financial text Investment Analysis & Portfolio Management:

[2] Booth. pp. 415 – 425.

> Rather than a public sale using one of these arrangements, primary offerings can be sold privately. In such an arrangement, referred to as a *private placement*, the firm designs an issue with the assistance of an investment banker and sells it to a small group of institutions. The firm enjoys lower issuing costs because it does not need to prepare the extensive registration statement required for a public offering. *The institution that buys the issue typically benefits because the issuing firm passes some of these cost savings on to the investor as a higher return.* In fact, the institution should require a higher return because of the absence of any secondary market for these securities, which implies higher liquidity risk.[3] (latter emphasis added.)

Therefore, the yield spread between corporate bonds and privately placed bonds would likely be related to the risk of the institution being able to resell the placement in a secondary market, and *not* higher business risk.

Q. Dr. Zepp's second response is to claim that Staff used the wrong measure of equity to implement Equation 6 (unlevered beta) in its direct testimony. (See rebuttal testimony of Thomas M. Zepp. p. 29 at 22 – 26.) Please comment.

A. The Ibbotson Associates yearbook cited in Staff's direct testimony indeed uses the market value of equity to calculate unlevered betas. However, regardless of how Ibbotson Associates unlevers their betas, we are not concerned with market equity ratios in this proceeding. It would be nonsensical to unlever beta with a market equity ratio and relever it with a book equity ratio and apply it to a book value rate base. Dr. Zepp attempts to discredit Staff's capital structure adjustment by comparing market values to book values and he ignores the simple fact that the sample water companies are more leveraged than Arizona Water. Dr. Zepp should compare apples to apples.

Q. Dr. Zepp's third response is to take issue with Staff's assumption that Arizona Water has the same business risk as the sample water companies. He states that you "[have] no evidence to make such a result-driven assumption." (See rebuttal

---

[3]Reilly, Frank K., Keith C. Brown. Investment Analysis & Portfolio Management. 2003. Thomson South-Western. Mason, OH. p. 111.

testimony of Thomas M. Zepp. p. 30 at 15 – 17.) Does evidence suggest Arizona Water has the same business risk as the sample water companies?

A. Yes. Business risk is the uncertainty of income caused by the firm's *industry*.[4] All of the sample water companies are in the regulated water utility industry. The assumption is not result driven as it is an assumption made before a reasonable result is calculated.

The Three-Factor Model

Q. On page 31 of his rebuttal testimony Dr. Zepp mentions studies performed by Fama and French. Dr. Zepp states that Fama and French have found there are three systematic risks: market risk (beta), size, and distress. (See rebuttal testimony of Thomas M. Zepp. p. 31 at 5 – 9.) Is Staff aware of these studies?

A. Yes. Fama and French published their first study in 1992 which found that during the period 1963 to 1990, small companies and companies with low multiples of book values had higher returns than average stocks. Stocks selling at low multiples of their book values are often called value stocks (Dr. Zepp refers to this situation as distress), whereas stocks selling at high multiples of their book values are called growth stocks. As a result of their studies, Fama and French developed an alternative three-factor asset pricing model where, in addition to the market risk premium, risk factors associated with firm size and differences between growth and value firms are present.

Q. Are there problems associated with the Fama-French model?

A. Yes. In the 2002 financial text Intermediate Financial Management, Brigham and Daves discuss three reasons why the majority of managers are using the CAPM and *not* the Fama-French three-factor model. The first reason is data availability. For example, the data required for the size factor and book value-to-market value factor are not readily available. The second reason is that while historical data related to these factors is

---

[4] Reilly, Frank K., Keith C. Brown. p. 338.

available, we don't know whether the historical average returns for these factors (size and book value-to-market value) are good estimators of expected returns. The third reason managers haven't adopted the Fama-French model, according to Brigham and Daves, is that it has *not* been widely accepted by the academic community. On page 94 of Intermediate Financial Management Brigham and Daves state:

> In fact, there are a number of very recent studies indicating that the Fama-French model is not correct.[5] Several of these studies suggest that the size effect is no longer having an effect on stock returns, that there never was a size effect (the previous results were caused by peculiarities in the data sources), or that the size effect doesn't apply to most companies. Other studies suggest that the book-to-market effect is not as significant as first supposed and that the book-to-market effect is not caused by risk. Another recent study shows that if the composition of a company's assets were changing over time with respect to the mix of physical assets and growth opportunities (such as R&D, patents, etc.), then it would appear as though there were size and book-to-market effects. In other words, even if the returns on the individual assets conform to the CAPM, changes in the mix of assets would cause the firm's beta to change over time in such a way that the firm will appear to have size and book-to-market effects.[6] [7]

Another interesting observation concerning the original Fama-French study is related to the time period they examined; 1963 - 1990. During that period value stocks (stocks that Dr. Zepp would describe as being in "distress") did much better than growth stocks. Growth stocks gained in the 1960s and peaked in 1972, going into a long bear market

---

[5] See Peter J. Knez and Mark J. Ready, "On the Robustness of Size and Book-to-market in the Cross-Sectional Regressions, "*Journal of Finance*, September 1997, 1355-1382; Dongcheol Kim, "A Reexamination of Firm Size, Book-to-market, and Earnings Price in the Cross-Section of Expected Stock Returns," *Journal of Financial and Quantitative Analysis*, December 1997, 463-489; Tyler Shumway and Vincent A. Warther, "The Delisting Bias in CRSP's Nasdaq Data and Its Implications for the Size Effect." *Journal of Finance*, December 1999, 2361-2379; Tim Loughran, "Book-to-Market Across Firm Size, Exchange, and Seasonality: Is There an Effect?" *Journal of Financial and Quantitative Analysis*, September 1997, 249-268; and Ilia D. Dichev, "Is the Risk of Bankruptcy a Systematic Risk?" *Journal of Finance*, June 1998, 1131-1147.

[6] See Jonathan B. Berk, Richard C. Green, and Vasant Naik, "Optimal Investment, Growth Options, and Security Returns," *Journal of Finance*, October 1999, 1553-1608.

[7] Brigham, Eugene F., Phillip R. Daves. Intermediate Financial Management. 2002. South-Western. pp. 93-94.

while value stocks such as oil companies soared. In the technology boom of 1990 - 2000 (after the original Fama-French study) growth stocks gained relative to value stocks.[8]

The Zepp Article

Q. On page 33 of his rebuttal testimony Dr. Zepp presents his soon-to-be published article "Utility Stocks and the Size Effect – Revisited" ("Zepp article"). Has Staff reviewed the Zepp article?

A. Yes. Staff reviewed the Zepp article and found four reasons the Commission should not rely on it:

1. Dr. Zepp's annual beta calculation contains several critical flaws.
2. The "new evidence on risk premiums required by small utilities" introduced in the Zepp article includes the California Public Utility Commission ("CPUC") Staff study and the current Zepp study, which Staff has already addressed in its direct testimony.
3. Dr. Zepp cannot dispute the fact that Wong found the size effect for utilities to be insignificant in every period from 1968 to 1987 using monthly and daily data, and in three out of four periods using weekly data.
4. Dr. Zepp's statement that "if the small firm effect is explained by differential information … differences in available information suggests there is a small firm effect in the utility industry"[9] is not necessarily true.

Dr. Zepp's Annual Beta

Q. On page 579 of the Zepp article Dr. Zepp reports a beta ("Zepp annual beta") that he calculated using annual return data for Connecticut Water Service, Middlesex

---

[8] Siegel, Jeremy. Stocks for the Long Run. 2002. McGraw-Hill. New York. 3rd edition. pp. 138.
[9] Zepp, Thomas M., "Utility Stocks and the Size Effect – Revisited." *The Quarterly Review of Economics and Finance.* (43) 2003. pp. 578 – 582.

Water, and SJW Corporation, and compares it to the average *Value Line* beta for these companies. Did Staff review Dr. Zepp's beta calculation?

A. Yes. Dr. Zepp uses the Zepp annual beta reported in his article to support his claim that when annual data are used to estimate betas for small utility stocks, the beta estimate increases. However, upon reviewing the calculations and data underlying the Zepp annual beta, Staff has found that they cannot be used to support Dr. Zepp's claim.

Q. What problems did Staff find with Dr. Zepp's annual beta calculation?

A. The first problem Staff found with the Zepp annual beta calculation is related to Dr. Zepp's "pooling" of his return data. On page 579 of his article Dr. Zepp states that his annual beta is "estimated with pooled annual data for the utilities ... it is assumed that the underlying beta for each of the water utilities is the same." This "pooling" of returns essentially amounts to manufacturing data points which, in turn, increase the statistical significance of his annual beta.

Q. How does pooling the return data increase the statistical significance of the Zepp annual beta?

A. Pooling the return data increases the statistical significance of the Zepp annual beta because instead of having just five data points to calculate a beta based on five years worth of annual returns, Dr. Zepp used fifteen data points to calculate a beta based on five years worth of annual returns. In other words, Dr. Zepp has manufactured ten additional data points. More data points result in higher statistical significance.

Q. Could Dr. Zepp have calculated a meaningful annual beta without pooling his return data?

A. No. Dr. Zepp could have assumed "that the underlying beta for each of the water utilities is the same" by averaging the annual returns of the three companies and then running a regression with five annual returns. However, the Zepp annual beta calculated under this method would not have been significantly different from zero at the .05 significance level.

Q. **In a footnote on page 579 of his article Dr. Zepp states that he used a dummy variable in 1999 "to reflect the proposed acquisition of SJW Corporation." Is the Zepp annual beta significantly different from zero if you remove Dr. Zepp's dummy variable?**

A. No. Staff removed Dr. Zepp's dummy variable from his regression and the resulting beta was not significantly different from zero at the .05 significance level.

Q. **Did Staff uncover any problems related to the statistical test Dr. Zepp used to test the significance of his annual beta?**

A. Yes. In testing whether his annual beta was significantly different than the average *Value Line* beta Dr. Zepp used a one-tailed test when he should have used a two-tailed test. By using a one-tailed test Dr. Zepp assumed that a beta estimated with annual data could only be higher, and not lower, than a beta estimated with weekly data. His assumption is contrary to a 1977 study conducted by David Levhari and Haim Levy which found beta for defensive stocks (those with a beta less than 1.0) decreases when the return interval increases.[10]

Q. **Is the Zepp annual beta significantly different from the average *Value Line* beta when a two-tailed test is conducted?**

A. No. The Zepp annual beta is not significantly different from the average *Value Line* beta at the .05 significance level if a two-tailed test is used.

[10] Levhari, David. Levy, Haim. "The Capital Asset Pricing Model and the Investment Horizon." *The Review of Economics and Statistics*. February 1977. pp. 92 -104.

Q. Can the Zepp annual beta be compared to *Value Line* betas?

A. No, it cannot. Dr. Zepp's annual beta cannot be compared to the average *Value Line* beta for four reasons. First, Dr. Zepp used the S&P 500 index as the market proxy whereas *Value Line* uses the New York Stock Exchange ("NYSE") Composite Index. On page 271 of the financial text Investments, Nancy L. Jacob and R. Richardson Pettit indicate that differences can exist between beta estimates based on the use of the S&P 500 index rather than the NYSE index.[11]

The second reason Dr. Zepp's annual beta cannot be compared to *Value Line* betas is the fact that Dr. Zepp used total returns (dividends and capital gains) for the companies in his sample and total returns for the S&P 500 index while *Value Line* uses changes in the price of a stock and changes in the NYSE index.

Another reason Dr. Zepp's annual beta cannot be compared to *Value Line* betas is the fact that *Value Line* does not use "pooled" return data to calculate beta.

Finally, Dr. Zepp's annual beta cannot be compared to *Value Line* betas because, to the best of my knowledge, *Value Line* does not use dummy variables in their regressions.

Q. Did Staff attempt to re-create Dr. Zepp's annual beta using the NYSE index and price returns that are more comparable to the data *Value Line* uses?

A. Yes. Staff obtained closing prices for Connecticut Water Service, Middlesex Water, SJW Corporation, and the NYSE Composite Index for the period 1995 – 2000 from msn Money, and attempted to calculate annual betas.

Q. Please describe Staff's analysis and findings.

---

[11] Jacob, Nancy L., Pettit, R. Richardson. Investments. Irwin. Homewood, Ill. 1988. p. 271.

A. Staff began by calculating annual beta estimates for each of the three companies using five years of annual price returns and the NYSE Composite Index. None of the annual beta estimates calculated by Staff were significantly different from zero. The annual beta estimate for SJW Corp. became significant only when a dummy variable was added in 1999, but the beta estimate was no longer comparable to *Value Line* betas. Staff replicated Dr. Zepp's "pooling" method and the resulting beta estimate was not statistically different from zero, unless a dummy variable was added in 1999 for SJW Corp.

Staff concluded that meaningful beta estimates comparable to *Value Line* betas could not be calculated using five years of annual data. Staff further concluded that the sole factor driving statistical significance for any of its beta estimates was the dummy variable in 1999 for SJW Corp.

New Evidence

Q. Has Staff reviewed the "new evidence on risk premiums required by small utilities" mentioned in the Zepp article?

A. Yes. The first "new" piece of evidence is the CPUC Staff study cited by Dr. Zepp on page 20 of his direct testimony. Staff addressed the CPUC Staff study and explained why the Commission should reject it for use in Arizona on pages 62 – 63 of its direct testimony. The other "new" piece of evidence is the current Zepp study presented by Dr. Zepp on pages 20 – 21, and Table 8 of his direct testimony.

Q. Does Staff have any general comments on the current Zepp study as it is presented in the Zepp article?

A. Yes. The only observation Staff has regarding the current Zepp study as it is presented in the Zepp article is that it is the more successful of the two Zepp studies Staff is aware of. The results of the other Zepp study, referred to as the "2000 Zepp study" on page 67 of Staff's direct testimony, are *not* reported in the Zepp article. As mentioned on page 67 of Staff's direct testimony, the results of the 2000 Zepp study have lower statistical significance than even the current Zepp study. The current Zepp study and the 2000 Zepp study are essentially the same study, except for the way Dr. Zepp calculates expected dividend growth. Dr. Zepp only reported the more successful study (the current Zepp study) in the Zepp article. Staff will address the actual validity of the current Zepp study later in its surrebuttal testimony.

Wong Findings

Q. Does the Zepp article find any fault with the empirical results of the Wong study?

A. No. The Zepp article does nothing to contradict the results of the Wong study. Wong found the size effect for utilities to be insignificant in every period from 1968 to 1987 using monthly and daily data, and in three out of four periods using weekly data. The Zepp article acknowledges and does not dispute the empirical findings of Wong.

Differential Information

Q. Why is Dr. Zepp's statement that "if the small firm effect is explained by differential information ... differences in available information suggests there is a small firm effect in the utility industry" not necessarily true?

A. Dr. Zepp's statement is not necessarily true because even if more information is produced in a rate proceeding for a large utility than in a rate proceeding for a smaller utility, it does not always hold that parties to the large utility proceeding will receive a larger piece of the information "pie" than the parties to the small proceeding. It makes sense that there will be a smaller amount of total information concerning a smaller utility, and a larger percentage of that information may come out in a small utility rate proceeding than will come out in a large utility rate proceeding. Thus, if the differential information hypothesis is correct, it does not necessarily suggest the existence of a small firm effect for utilities.

The Zepp Study

Q. Should the Commission rely on the Zepp study?

A. No. On pages 64 – 68 of Staff's direct testimony I provided three reasons the Commission should not rely on the Zepp study. First, Staff's confidence interval constructed in Exhibit JMR-1 of its my testimony shows that, with 95 percent confidence, it is plausible that the average difference between the cost of equity to larger and smaller water utilities is zero. Second, the only way Dr. Zepp can find his results statistically significant under his own statistical test is to use an unusually low confidence/significance level. Finally, Dr. Zepp conducted a one-tailed hypothesis test when he should have conducted a two-tailed test.

Q. On pages 39 – 40 of his rebuttal testimony Dr. Zepp states that his paired difference test, and not Staff's confidence interval, is the appropriate method to test the statistical significance of the Zepp study. (See rebuttal testimony of Thomas M. Zepp. p. 39 at 3 – 7.) Is he correct?

A. No. Below, I provide an example showing that Staff's confidence interval is the appropriate test to use. I also explain why the example Dr. Zepp provided from Professor Mendenhall's book is *not* analogous to the Zepp study and I provide a better example of a paired difference test that clearly shows why it should not be used to test the Zepp study.

Q. Why is the example from Professor Mendenhall's book provided by Dr. Zepp *not* analogous to the Zepp study?

A. The example from Professor Mendenhall's book is not analogous to the Zepp study because the samples of larger and smaller water utilities were independently drawn. Dr. Zepp cannot claim that the large water utilities and the small water utilities in the Zepp study are not independent samples. Dr. Zepp attempts to draw an analogy between the Zepp study and the Mendenhall example by comparing a *year* in the Zepp study to an *automobile* in the Mendenhall example. This comparison is not appropriate.

Q. Can Staff provide an example of a confidence interval that shows it is the appropriate method to test the significance of the Zepp study?

A. Yes. Professor Ronald Wonnacott and Professor Thomas Wonnacott provide an example of a confidence interval in their text Introductory Statistics. In Example 8-3, Wonnacott & Wonnacott compare the difference between the average grades of two classes of students:

> From a large class, a sample of 4 grades were drawn: 64, 66, 89, and 77. From a second large class, an *independent* sample of 3 grades were drawn: 56, 71, and 53. Calculate the 95% confidence interval for the difference between the two class means ...[12] (emphasis added)

In the above example, the grades were drawn from students of separate classes representing independent samples. This is analogous to the Zepp study where equity costs were calculated for samples of companies drawn from separate classes representing independent samples (i.e. a sample of small water utilities was drawn from the population of small water utilities and a sample of large water utilities was drawn from the population of large water utilities.) Wonnacott & Wonnacott provide the equation for the confidence interval used by Staff to test the Zepp study, as the appropriate equation in the above example.

[12] Wonnacott, Ronald J., Wonnacott, Thomas H. Introductory Statistics. 1985. John Wiley & Sons. New York. p. 232.

Q. Do Wonnacott & Wonnacott give an example of a paired difference test?

A. Yes. In Section 8-4 of Introductory Statistics, Wonnacott & Wonnacott provide an example of paired samples:

> Suppose a comparison of fall and spring grades is done *using the same students both times*. Then the paired grades (spring X_1 and fall X_2) for each of the students can be set out, as in Table 8-3.[13] (emphasis added)

The students in this example are analogous to the automobiles in the Mendenhall example cited by Dr. Zepp, and grades in the fall and spring are analogous to mounting two different types of tires on the rear wheels of each automobile in the Mendenhall example. Clearly, a confidence interval would be inappropriate for both of these examples. This is because in both cases the samples are not independent. We are using the same students in the Wonnacott & Wonnacott example and we are using the same automobiles in the Mendenhall example.

A paired difference test is only appropriate when we have a paired sample; that is, a sample where we have pairs of values. The Mendenhall example is a paired sample because we have one pair of values (two different types of tires, one each on the rear of a vehicle) for each vehicle. The Wonnacott & Wonnacott example is a paired sample because we have a pair of grades (one in the fall and one in the spring) for each student.

A confidence interval is appropriate when we have values such as equity costs, drawn from independent samples such as large and small water utilities.

Q. On page 40 of his rebuttal testimony Dr. Zepp responds to Staff's testimony that the only way he could find his results to be statistically significant is to adopt an

---

[13] Wonnacott. P. 236.

unusually low significance level of .1.[14] He states that standard t-tables show significance levels of between .25 percent and .0005 percent.[15] Please comment.

A. Staff is aware that standard t-tables report significance levels as low as .25. Staff is also aware that many statistics books indicate the preferred significance level is .05 or higher. On page 65 of Staff's direct testimony I cited the classic book <u>How to Lie with Statistics</u> by Darrell Huff. On page 42 of <u>How to Lie with Statistics</u> Mr. Huff states the following:

> How can you avoid being fooled by unconclusive results? Must every man be his own statistician and study the raw data for himself? It is not that bad; there is a test of significance that is easy to understand. It is simply a way of reporting how likely it is that a test figure represents a real result rather than something produced by chance. This is the little figure that is not there – on the assumption that you, the lay reader, wouldn't understand it. Or that, where there's an axe to grind, you would.
>
> If the source of your information gives you also the degree of significance, you'll have a better idea of where you stand … *for most purposes nothing poorer than this five per cent level of significance* [.05] *is good enough.* For some the demanded level is one percent [.01], which means that there are ninety-nine chances out of a hundred that an apparent difference, or whatnot, is real. Anything this likely is sometimes described as "practically certain."[16] (emphasis added)

In a study with such a small sample size as the Zepp study it behooves the analyst to use a common significance level of .05 or higher. If this is done, Dr. Zepp's results are not significant.

Q. On page 41 of his rebuttal testimony Dr. Zepp states that a one-tailed test is the appropriate test because a two-tailed test ignores the fact that scholars generally

---

[14] .1 significance level = 10% chance of committing a type one error.
[15] .25 significance level = 25% chance of committing a type one error. .0005 significance level = .05% chance of committing a type one error.
[16] Huff, Darrell. <u>How to Lie with Statistics</u>. Darrell Huff and Irving Geis. 1954. p. 42.

agree there is a small firm effect for stocks in general. (See rebuttal testimony of Thomas M. Zepp. p. 41 at 1 – 4.) Does Staff have any comments?

A. Staff has two comments. First, we are not testing to see if there is a small firm effect for stocks in general. We are testing to see if there is a small firm effect for utilities. Given the findings of the Wong study, lack of other studies supporting the existence of a size effect for utilities, and the extremely small sample size in the Zepp study, it is appropriate to use a two-tailed test.

Second, while it may be generally agreed that smaller stocks have earned higher returns historically than larger stocks, new evidence increasingly indicates that there never was a size effect. A 1999 study published in *The Journal of Finance* found that after correcting for the bias caused by missing returns for delisted stocks, there is no evidence that there ever was a size effect for Nasdaq stocks. In the article, Shumway and Warther state that Nasdaq stocks are ideal for examining the size effect because they are the smallest and most distressed stocks. Their finding for Nasdaq stocks is evidence against the hypothesis that the size effect is due to the systematic pricing of the distress risk of smaller firms.[17]

The CAPM

Q. On page 42 of his rebuttal testimony Dr. Zepp presents what he calls a "general" form of the CAPM (equation 2) which includes a zero beta asset (R_z) and a second risk factor (SR) representing "any other systematic risks that investors consider in the pricing of stocks" and characterizes the CAPM used by Staff and RUCO as a "very specific" version of the CAPM (equation 3). (See rebuttal testimony of Thomas M. Zepp. p. 42 at 14 – 25.) Please respond.

---

[17] Shumway, Tyler. Warther, Vincent A. "The Delisting Bias in CRSP's Nasdaq Data and Its Implications for the Size Effect." *The Journal of Finance*. December 1999. 2361 – 2379.

A. The CAPM adopted by Staff and RUCO actually conforms to the original CAPM. It is the version most widely used by companies, and it is more popular than any other method of estimating the cost of equity among firms.[18] The version Dr. Zepp presents in equation 2 on page 42 of his rebuttal testimony is actually an extended version of the original CAPM. Extended versions of the CAPM, including the subjective, ad hoc risk premium approach which on page 44 of his testimony Dr. Zepp claims is the preferred method, are actually *not* preferred methods.

Q. On page 47 of his rebuttal testimony Dr. Zepp claims that empirical studies of the original CAPM have found the required return for the zero-beta asset to be higher than the Treasury bill rate. (See rebuttal testimony of Thomas M. Zepp. p. 47 at 7 – 8.) What is the zero-beta asset?

A. The zero-beta asset is a portfolio of assets that has no covariability with the market portfolio. The required return on the zero-beta asset (R_z) is used in place of the return on U.S. Treasuries (R_f) in the extended version of the CAPM known as the zero-beta CAPM. The zero-beta CAPM is said to be flatter than the original CAPM, resulting in higher expected returns for low beta stocks and lower expected returns for high beta stocks compared to the original CAPM.

Q. On pages 49 – 50 of his rebuttal testimony Dr. Zepp mentions two specific studies which he claims found the required return for the zero-beta asset to be higher than the yield on Treasury bills. (See rebuttal testimony of Thomas M. Zepp. p. 49 at 10 – 26.) Has Dr. Zepp shown that the results of those studies can be applied to Staff's CAPM?

[18] Graham, John R. Campbel R. Harvey. "The Theory and Practice of Corporate Finance: Evidence from the Field." *Journal of Financial Economics*. 60 (2001) pp. 187-243.

A. No. Unlike Staff's CAPM, the CAPM tests cited by Dr. Zepp used *short-term* Treasury bills and *raw* (unadjusted) betas. Dr. Zepp has not provided evidence that the results of CAPM studies which use *short-term* Treasury bills and *raw* betas can be appropriately applied to a CAPM application such as Staff's that uses *intermediate-term* Treasury notes, which generally have *higher* returns than T-bills, and *Value Line* betas that are adjusted towards 1.0, which *increase* the required returns for low beta stocks such as utilities. In other words, although Staff's CAPM analysis conforms to the original version, it produces required returns *higher* than what the original CAPM would produce.

Further, Dr. Zepp has not shown that a zero-beta CAPM application, appropriately applied, would produce higher required returns than Staff's CAPM. Such an application would require an estimate of the current required return on the zero-beta asset, which must be empirically inferred from the prices of securities, and raw betas.

Q. On pages 50 - 51 of his rebuttal testimony Dr. Zepp restates Staff's CAPM results using analysts' forecasts of long-term Treasury bond yields. Does Staff agree with Dr. Zepp's restatement of its CAPM?

A. No. First, Dr. Zepp's use of a forecasted Treasury bond yield is inappropriate. On pages 46 – 47 of Staff's direct testimony I explained why the Commission should *not* rely on forecasted interest rates. Second, Dr. Zepp's use of a long-term Treasury bond as the risk-free rate (R_f) in the CAPM is contrary to suggestions by financial experts that most investors consider the intermediate time frame (5-10 years) a more appropriate investment horizon.[19] Also, when using the CAPM to estimate the cost of equity to a public utility, it makes sense that the risk-free rate that is chosen should be an estimate of the rate expected to prevail during the period that rates are in effect. Third, a long-term Treasury bond yield is inappropriate for use in a CAPM for a utility rate proceeding because it includes a risk

[19] Reilly, Frank K., and Keith C. Brown. Investment Analysis and Portfolio Management. 2003. South-Western. Mason, OH. p. 439.

premium above and beyond expected future interest rates, which R_f represents in the CAPM. This risk premium is called a "liquidity risk premium." If Dr. Zepp's risk-free rate includes a risk premium it cannot be risk-free; and an analyst cannot use it in a CAPM analysis. Brealey and Myers describe how a long-term Treasury bond yield can be corrected for use in the CAPM in their book Principles of Corporate Finance:

> The risk-free rate could be defined as a long-term Treasury bond yield. If you do this, however, you should subtract the risk premium of Treasury bonds over bills ... This figure could in turn be used an expected average future r_f in the capital asset pricing model.[20]

Constant-Growth DCF Method

Q. How does Staff respond to Dr. Zepp's statement that "knowledgeable investors relying on the constant-growth DCF model would not use past DPS growth or forecasts of near-term DPS growth to determine growth?" (See rebuttal testimony of Thomas M. Zepp. p. 54 at 10 – 11.)

A. His statement is speculative. Dr. Zepp qualifies his statement by claiming that past DPS growth and forecasts of near-term DPS growth are the worst indicators of future growth when an industry is in transition and companies within that industry are in the process of attempting to increase their financial strength. (See rebuttal testimony of Thomas M. Zepp. p. 53 at 8 – 11.) However, investors receive dividends, and the discounted value of dividends received in the first several years of owning a stock are reflected in its market price – whether DPS are expected to grow more rapidly in the future or not. Further, such a statement assumes that an industry has been in transition for ten years, and ignores the over-optimism in analysts' earnings forecasts that investors are aware of. As stated on page 43 of Staff's direct testimony, to the extent that investors are aware of the bias in

[20] Brealey, Richard. Myers, Stewart C. Principles of Corporate Finance. 3rd edition. McGraw-Hill. New York. 1988. p. 184.

analysts' projections of future earnings, they will make appropriate adjustments – possibly by considering more-stable DPS growth.

Q. Does the Gordon, Gordon, and Gould ("GG&G") article cited by Dr. Zepp support his argument that past DPS growth should not be included in a DCF cost of equity analysis?

A. No, it does not. Dr. Zepp uses the GG&G article to support his position not to include past DPS growth in a constant-growth DCF analysis. The GG&G article simply concluded that analysts' forecasts of growth in EPS outperformed past BR (retention) growth, past DPS growth, and past EPS growth during the period of their study. The following quote from the GG&G article gives perspective:

> For our sample of utility shares, [forecasts of earnings growth] performed well, with [past BR growth], [past DPS growth], and *[past EPS growth] a distant fourth.*[21] (emphasis added)

The GG&G article concludes that the worst performer was past EPS growth, not past DPS growth, and that past EPS growth was distant in its inferiority.

Q. Does the GG&G article state that forecasts of EPS should be the only determinant of perpetual dividend growth in the constant-growth DCF model?

A. No. The article does not state that forecasted EPS growth is the only growth rate to be used in a constant-growth DCF analysis. Furthermore, it does not suggest that investors rely solely on analysts' forecasts of EPS growth when pricing stocks.

Q. Has Professor Gordon commented on the appropriate dividend growth rate to be used in his DCF model subsequent to the GG&G article?

---

[21] Gordon, David A., Myron J. Gordon, Lawrence I. Gould. "Choice Among Methods of Estimating Share Yield." *The Journal of Portfolio Management*. Spring 1989. p. 54.

A. Yes. On May 8, 1998, approximately nine years after publication of the GG&G article, Professor Gordon provided the keynote Address at the 30th Financial Forum of the Society of Utility and Regulatory Financial Analysts. In referencing the Federal Energy Regulatory Commission's ("FERC") use of an average of security analysts' forecasts of the short-term earnings growth rate and a typically lower figure such as the past growth rate in GNP, Professor Gordon said:

> Such an average can be questioned on various grounds. However, my judgment is that between the short-term forecast alone and its average with the past growth rate in GNP, *the latter may be a more reasonable figure*. Furthermore, the above average may deserve regulatory consideration along with other plausible estimates of the cost of equity capital, in the absence of a superior method for taking advantage of security analyst forecasts.[22] (emphasis added)

Dr. Zepp does not average his forecasted growth rates with any historical growth rates.

Q. How does Staff respond to Dr. Zepp's statement on page 55 of his rebuttal testimony that, to the extent analysts have already taken historical growth into account in their forecasts, Staff's approach double-counts the past? (See rebuttal testimony of Thomas M. Zepp. p. 55 at 8 – 12.)

A. As stated on page 40 of Staff's direct testimony, Staff agrees that professional analysts may have considered past growth in their forecasts. However, the appropriate growth rate to use in the DCF formula is the dividend growth rate expected by *investors*, not analysts. Therefore, the reasonable assumption that investors rely, to some extent, on past growth in addition to analysts' forecasts, warrants consideration of both.

Q. On pages 55 – 56 of his rebuttal testimony Dr. Zepp attempts to show that past DPS growth and near-term forecasts of DPS growth would not be considered by investors by conducting an ad hoc analysis of Staff's expected dividend yields and past and

---

[22] Gordon, M.J. Keynote Address at the 30th Financial Forum of the Society of Utility and Regulatory Financial Analysts. May 8, 1998. p. 4.

forecasted DPS growth rates. He calculates constant-growth DCF estimates ranging from 6.0 percent to 7.2 percent. Should the Commission give this portion of Dr. Zepp's rebuttal testimony any weight?

A. No. This portion of Dr. Zepp's rebuttal testimony should be given no weight by the Commission for several reasons. First, Dr. Zepp implicitly assumes that authorized ROEs equal equity costs. Staff has already addressed the problems associated with assuming authorized ROEs equal equity costs. Second, Dr. Zepp relies on forecasts of Baa corporate bond rates. Staff has already explained why the Commission should not rely on interest rate forecasts. Third, Dr. Zepp again makes the fatal mistake of comparing the rate on Baa corporate bonds to the cost of equity. Staff has already explained why corporate bond yields cannot be used to imply meaningful equity risk premiums. Fourth, Dr. Zepp adds Staff's past and forecasted DPS growth rates to the expected dividend yield to arrive at DCF cost of equity estimates ranging from 6.0 percent to 7.2 percent. This procedure is inappropriate because Staff does not rely solely on DPS growth in its constant-growth DCF analysis, nor does Staff suggest that rational investors rely solely on DPS growth when pricing stocks. This portion of Dr. Zepp's testimony is a straw man and should be given no weight by the Commission.

Multi-Stage DCF Method

Q. How does Dr. Zepp modify Staff's multi-stage DCF analysis?

A. On pages 57 – 59 of his rebuttal testimony Dr. Zepp modifies Staff's multi-stage DCF analysis by injecting a supernormal growth stage between the first and second stages of growth. He assumes that investors expect this supernormal growth to occur during years 2007 – 2016.

Q. Are his modifications appropriate?

A. No. His modifications are not appropriate for two reasons. First, Dr. Zepp assumes that investors would use *Value Line*'s projected retention ("BR") growth rate to project dividends in 2007 and 2008. This is inappropriate because *Value Line* already projects DPS growth in those years. Investors relying on a multi-stage DCF model would use information concerning DPS growth to the greatest extent possible in the first stage.

Second, Dr. Zepp takes *Value Line*'s projected BR growth rate for 2006 – 2008 and misapplies it to years 2009 – 2016. *Value Line* does not project growth for the years 2009 – 2016, and Dr. Zepp's perpetual growth rate does not begin until the year 2017. Therefore, inserting a projected BR growth rate for the years 2006 – 2008 into years 2009 – 2016, before starting the perpetual growth rate in 2017, is speculative. The Commission should give no weight to Dr. Zepp's restatement of Staff's multi-stage DCF analysis.

RESPONSE TO THE REBUTTAL TESTIMONY OF RALPH J. KENNEDY

Liquidity Premium

Q. On pages 21 – 24 of his rebuttal testimony Mr. Kennedy discusses the Company's Series K bond issue and states that potential investors required a liquidity premium. He also states that investors in the Company's common stock are likely to have the same concerns. (See rebuttal testimony of Ralph J. Kennedy. p. 23 at 19 – 22.) Does Staff agree that Arizona Water's equity investors would require a liquidity premium?

A. No. A liquidity premium is related to the risk that a security, initially sold in a primary market, cannot be easily sold in a secondary market. However, Arizona Water's stock is privately held, similar to the manner in which Arizona Public Service Co.'s stock is held by Pinnacle West Capital Corp., and thus there is no primary or secondary market and it is not subject to secondary market liquidity concerns. Assuming Arizona Water's stock was publicly traded, Staff's market-based ROE has already accounted for risks that would be priced by the market.

RESPONSE TO THE REBUTTAL TESTIMONY OF WALTER W. MEEK

CAPM

Q. **On page 5 of his rebuttal testimony Mr. Meek states that while the required returns being produced by the CAPM "may be theoretically sound, [they] are suspect, from a common sense perspective." (See rebuttal testimony of Walter W. Meek. P. 5 at 7 – 8.) Does Staff agree?**

A. No. Staff's CAPM cost of equity estimates average 9.4 percent. On pages 5 – 7 of Staff's direct testimony I provided information regarding historical returns for average risk securities as well as observational perspective on current capital costs. On page 6 of Staff's direct testimony I reported that Wharton School finance professor Jeremy Siegel published his finding that the average compound and arithmetic returns on U. S. equities have been 8.3 percent and 9.7 percent, respectively, using 199 years of data from 1802 through 2001.[23] One should keep in mind that these returns are actual returns, not expected returns. However, the risk of a regulated water utility, as measured by beta, is significantly below the theoretical beta (1.0) of average risk securities. Therefore, Staff's recommendation is consistent with published returns and informed common sense.

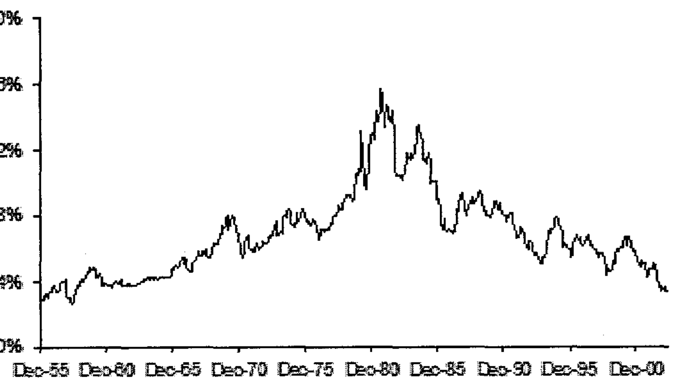
Q. **Does evidence suggest that capital costs in general are lower now than they have been in decades?**

A. Yes. On page 6 of Staff's direct testimony I presented Chart 2, shown below. Chart 2 of Staff's direct testimony puts interest rates and capital costs in general, into historical perspective. Interest rates have declined significantly in the past twenty years and are currently at their lowest level since the 1950s.

---

[23] Siegel, Jeremy J. Stocks for the Long Run. 3rd edition. McGraw-Hill, New York. 2002. p. 13.

Chart 2: History of 5- and 10-Year Treasury Yields



According to the CAPM, the cost of equity moves in the same direction as interest rates. Chart 2 suggests that capital costs, including the cost of equity, are lower than they have been in decades.

Q. On page 5 of his rebuttal testimony Mr. Meek states that the required return produced by Staff's CAPM is "substantially less than what water and gas companies are currently earning, and well below *Value Line*'s projections for 2004 and the 2006 – 2008 time period." (See rebuttal testimony of Walter W. Meek. p. 5 at 11 – 14.) Mr. Meek again cites returns reported by C. A. Turner Utility Reports on page 9 of his rebuttal testimony. What type of return is Mr. Meek referring to?

A. Mr. Meek is referring to book/accounting returns. Book returns represent what the sample water companies have recorded or are projected to record as book earnings as a percentage of common equity. These particular book returns do not represent current *market* returns, and therefore cannot be used to gauge the current cost of equity.

Q. Does *Value Line* project market returns for the sample water companies?

A. Yes. In the upper-left-hand corner of the *Ratings & Reports*, *Value Line* projects the average annual market return – this is price appreciation plus dividend income, for each company for the next three-to-five years. *Value Line*'s projected three-to-five year price appreciation plus dividend income return for American States Water, California Water, and Philadelphia Suburban Corp. averages 6.2 percent. The investors represented by Mr. Meek would logically look at this projection before examining book returns if they were purchasing stock in these companies.

Risk

Q. On page 7 of his rebuttal testimony Mr. Meek states that he does not agree with Staff's testimony that "the risk associated with a particular firm is 'eliminated' if securities are purchased in portfolios." (See rebuttal testimony of Walter W. Meek. p. 7 at 5.) What type of risk is Staff referring to?

A. Staff is referring to unique risk. Unique risk is also known as diversifiable risk, or unsystematic risk.

Q. Can Staff explain how the unique risk of a security can be eliminated through shareholder diversification?

A. Yes. According to modern portfolio theory ("MPT"), investors purchase assets in portfolios, and in doing so reduce the total variation of their returns. The total variation of a portfolio is less than the sum of its parts because in a diversified portfolio of risky assets some returns are high while others are low, offsetting each other. For example, stock A (a suntan lotion company) and stock B (an umbrella company) are both expected to earn 10 percent and have equivalent risk. However, it seems that returns on the two stocks move in exactly opposite directions. When it is sunny, stock A makes unusually good returns but stock B makes unusually poor returns. When it is rainy, stock B makes unusually good returns and stock A makes unusually poor returns. Combining the two stocks in a portfolio allows all risk to be diversified away, even though each of the companies' returns is still quite risky independently. This risk that can be diversified away becomes irrelevant and investors do not require a return on this unique risk. Diversification allows investors to reduce their level of risk exposure for any given level of expected return. The risk that is left is called systematic risk. Systematic risk measures the extent to which a security's returns are correlated with returns in the general market of risky assets.

MPT is a widely accepted concept that gained added fame in 1990 when the Nobel Prize in Economic Sciences was awarded to Harry Markowitz, Merton Miller, and William Sharpe for their work on the concept.

CONCLUSION

Q. Please summarize Staff's recommendations.

A. Staff continues to recommend the Commission adopt a 9.0 percent ROE, an 8.46 percent cost of long-term debt, a 4.0 percent cost of short-term debt, and an 8.6 percent rate of return. Staff recommends the Commission give little weight to the rebuttal testimony of Company witness Dr. Thomas Zepp. Staff disagrees with his methods and his estimates are not representative of current costs of equity.

Q. Does this conclude Staff's surrebuttal testimony?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

MARC SPITZER
Chairman
JIM IRVIN
Commissioner
WILLIAM A. MUNDELL
Commissioner
JEFF HATCH-MILLER
Commissioner
MIKE GLEASON
Commissioner

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY FOR ADJUSTMENTS TO ITS RATES AND CHARGES FOR WATER UTILITY SERVICE	DOCKET NO. W-01445A-02-0619

SURREBUTTAL

TESTIMONY

OF

JOHN S. THORNTON, JR.

CHIEF, FINANCIAL & REGULATORY ANALYSIS SECTION

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

SEPTEMBER 3, 2003

TABLE OF CONTENTS

Page

Introduction 1

Summary of testimony and recommendations 1

Comments on the testimony of William M. Garfield 1

Comments on the testimony of Ralph J. Kennedy 2

EXECUTIVE SUMMARY
ARIZONA WATER COMPANY
DOCKET NO. W-01445A-02-0619

Mr. Thornton's surrebuttal testimony responds to Arizona Water Company's ("Arizona Water" or the "Company") testimony regarding the three-tiered rate design and its basis in marginal cost principles. The Company argues that three-tiered rate design is flawed for a number of reasons. Mr. Thornton addresses the Company's concerns and continues to recommend a three-tiered commodity rate structure given the increasing marginal cost of new supply.

INTRODUCTION

Q. Please state your name.

A. My name is John S. Thornton, Jr.

Q. Are you the same John S. Thornton, Jr. who testified earlier?

A. Yes, I am.

Q. What is the scope of your surrebuttal testimony?

A. My testimony responds to Arizona Water Company's testimony regarding the appropriateness of tiered rates and applying marginal cost pricing principles in this proceeding.

SUMMARY OF TESTIMONY AND RECOMMENDATIONS

Q. Briefly summarize your testimony.

A. I correct certain misunderstandings and miscommunications on the part of Arizona Water Company regarding my prepared direct testimony. In particular, I clarify that Staff applied the marginal cost pricing approach in this case to inject a forward-looking cost of service approach to rate design. Staff neither *intended* to produce subsidies between meter classes nor did it *intend* to develop tiered rates purely for conservation reasons.

COMMENTS ON THE TESTIMONY OF WILLIAM M. GARFIELD

Q. Mr. Garfield testifies on page 17 at 12 to 16 that "[S]taff seeks to subsidize certain residential customers by shifting revenue requirements to commercial and other non-residential customers with no basis whatsoever for such a change, except Mr. Thornton's testimony that Staff's proposed rate design serves the greater "'social good.'" Is his characterization of Staff's intent and your testimony correct?

A. No, his testimony is not correct. Staff had no such intent to provide any subsidies beyond the lifeline rate, which is so limited (3,000 gallons) that it should be not be considered a widespread system of cross-subsidization shaping Staff's rate design. He seems to argue that the third tier is *intended* to subsidize users who would not fall into the third tier by those who would fall in the third tier. His speculation as to Staff's *intent* is incorrect.

Also, his testimony would appear to suggest that he is quoting the words "social good" from my testimony. I did not refer specifically to the "social good" in the testimony references he cites. His term "social good" might be considered to go beyond the point of Staff's approach (which is directed to social economic efficiency) and venture primarily into political or other social considerations. My testimony did not venture into these other considerations.

COMMENTS ON THE TESTIMONY OF RALPH J. KENNEDY

Q. What appear to be Mr. Kennedy's concerns with Staff's marginal cost pricing approach?

A. Mr. Kennedy testifies on page 9 at 17 to 22 that the approach is inadequately developed and lacks both depth and breadth of quantitative support.

Q. Do you agree that the marginal cost approach is inadequately developed and lacks both depth and breadth of quantitative support?

A. No, I do not agree with him. The approach has been developed over the past few decades and the marginal cost theory behind is as old as neoclassical economics. The marginal cost calculations and quantitative support can be relatively simple for a water system (though more complicated for an electric system as an example), but their simplicity in calculation should not be misconstrued as minimizing their importance.

Q. Mr. Kennedy testifies that Staff's rate design is not supported by a cost-of-service study. Do you agree?

A. No, I do not agree. In fact, Staff's marginal cost analysis is a cost-of-service study, though it is based on forward-looking costs rather than embedded costs on which a traditional study would rely.

Q. Regarding your specific calculation, Mr. Kennedy testifies on page 12 at 1 to 3 that Staff did not explain how it selected or dealt with reserve or unused capacity, or unaccounted for water. What is your response?

A. Those sort of details are normally left to working papers or their clarification through data requests. Despite Mr. Kennedy's lack of data request for such specific clarification, Staff is happy to answer his questions here: Staff selected its output denominator through an engineer's estimate of the number of customers that would be served by an additional well on the Apache Junction system. Staff dealt with unaccounted for water by using average end-use consumption per customer already on the system, rather than using pumped water. Staff did not assume reserve or unused capacity.

Q. Mr. Kennedy testifies on page 12 at lines 14 to 16 that he presumes that Staff agrees with and generally followed the article you cited, "Developing Rates With Citizen Involvement." Is his presumption correct?

A. No, his presumption is not correct. As I testified on page 9 at 7 to 9 of my direct testimony, "Staff relied on the National Regulatory Research Institute's publication *Cost Allocation and Rate design for Water Utilities* (NRRI90-17)" in applying the marginal cost approach. The article Mr. Kennedy cites was used to present a case study of applying the marginal cost principal to water rate setting. (See my testimony at page 4 beginning at 21.)

Q. Mr. Kennedy testifies on page 13 beginning at 17 that your testimony on price elasticity may lead readers to incorrect conclusions. What is his argument and is he correct?

A. Mr. Kennedy's argument seems to be that price inelasticity does not necessarily mean that rate design can disregard the effect of price elasticity. Unfortunately, Staff is recommending a commodity price *decrease* for Arizona Water Company's largest Eastern Group system, Apache Junction. If the Commission followed his advice then bill counts should be adjusted upward leading to even lower commodity rates. Mr. Kennedy does not recommend this adjustment in his testimony (which would lower rates further) and, therefore, does not appear to support his own argument in practice when the adjustment works against the Company's interest. To clarify, Staff did not make an elasticity adjustment in the case of either increased or decreased rates. An elasticity adjustment would be cumbersome and speculative, and therefore, no adjustment is appropriate in this proceeding.

Q. Does this conclude your surrebuttal testimony?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

MARC SPITZER
Chairman
JIM IRVIN
Commissioner
WILLIAM A. MUNDELL
Commissioner
JEFF HATCH-MILLER
Commissioner
MIKE GLEASON
Commissioner

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR ADJUSTMENTS TO ITS RATES AND CHARGES FOR UTILITY SERVICE FURNISHED BY ITS EASTERN GROUP AND FOR CERTAIN RELATED APPROVALS	)	DOCKET NO. W-01445A-02-0619

SURREBUTTAL

TESTIMONY

OF

RONALD E. LUDDERS

PUBLIC UTILITIES ANALYST V

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

SEPTEMBER 3, 2003

TABLE OF CONTENTS

Page

INTRODUCTION 1

SUMMARY OF COMPANY'S REBUTTAL TESTIMONY 1

- Plant In Service 2
- Accumulated Depreciation 3
- Working Capital Allowance 3
- Deferred CAP Charges 4
- Revenue Annualization 6
- Purchased Power Adjustment Mechanism 7
- Purchased Water Adjustor Mechanism 7
- Capital and Delivery Charges 8
- CAP Purchased Water Expense. Annualization Adjustment 9
- Rate Case Expense 10
- CIAC Amortization Rate 11
- Pinal Creek Group Issue 11

EXHIBITS

Revenue Requirements/Eastern Group & System Pages 1-9s .... Surrebuttal Exhibit REL-1

Arizona Department of Revenue Memo Pages 1 & 2 .... Surrebuttal Exhibit REL-2

Comparison- Present Rates. Company Proposed Rates. Staff's Direct Testimony RATES. Staff's Surrebuttal Rates Pages 1-16 .... Surrebuttal Exhibit REL-3

EXECUTIVE SUMMARY
ARIZONA WATER COMPANY CORPORATION
EASTERN GROUP
Docket No. W-01445A-02-0619

The surrebuttal testimony of Ronald E. Ludders responds to Arizona Water Company's rebuttal on the following issues:

1. Plant in Service - Phoenix Office and Meter Shop Allocations
2. Accumulated Depreciation
3. Working Capital Allowance
4. Deferred Central Arizona Project ("CAP") Charges
5. Revenue Annualization
6. Purchased Power Adjustment Mechanism ("PPAM")
7. Purchased Water Adjustment Mechanism ("PWAM")
8. CAP Capital and Delivery Charges
9. Rate Case Expense
10. Contributions in Aid of Construction Amortization Rate
11. Pinal Creek Group Issue

Staff's position on each of the adjustments and issues remains unchanged from its direct testimony with the exception of these revisions.

INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Ronald E. Ludders. I am a Public Utilities Analyst V employed by the Arizona Corporation Commission ("ACC" or "Commission") in the Utilities Division ("Division"). My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Are you the same Ronald E. Ludders who filed direct testimony in this case?

A. Yes, I am.

Q. What is the purpose of your surrebuttal testimony in this proceeding?

A. The purpose of my surrebuttal testimony in this proceeding is to respond, on behalf of the Division Staff ("Staff"), to the rebuttal testimony of various Arizona Water Company ("Arizona Water", "AWC", or "Company") witnesses in the areas of rate base, operating income, and revenue requirement.

Q. Did Staff attempt to address every issue raised by the Company in its rebuttal testimony?

A. No. Staff limited its discussion to certain issues as outlined below.

SUMMARY OF COMPANY'S REBUTTAL TESTIMONY

Q. Please summarize the Company's rebuttal testimony.

A. The Company indicated in its rebuttal testimony that it is in disagreement with Staff in the following issues:

1. Plant in Service - Phoenix Office and Meter Shop Allocations
2. Accumulated Depreciation

3. Working Capital Allowance
4. Deferred Central Arizona Project ("CAP") Charges
5. Revenue Annualization
6. Purchased Power Adjustment Mechanism ("PPAM")
7. Purchased Water Adjustment Mechanism ("PWAM")
8. CAP Capital and Delivery Charges
9. Water Testing Expenses
10. Rate Case Expense
11. Amortization of Contributions in Aid of Construction
12. Pinal Creek Group

Q. Please explain how Staff organizes its surrebuttal testimony.

A. Staff organizes its testimony following the Company's major points of disagreement listed above.

Plant In Service

Q. Has Staff reviewed the Company's rebuttal testimony regarding the Phoenix Office and Meter Shop Plant In Service allocations?

A. Yes it has.

Q. Does Staff agree with the Company that Staff erroneously removed all of the actual test year plant in service balances associated with the Phoenix Office and Meter Shop plant.

A. Yes it does. Consequently Staff increased Plant In Service by $1,502,908.

Accumulated Depreciation

Q. Did the Company raise any concerns about Staff's pro forma adjustments to accumulated depreciation for actual and post-test year plant additions?

A. Yes. Consistent with Staff's adjustment to Plant In Service, Staff increased Accumulated Depreciation by $227,756.

Q. Has Staff prepared schedules to reflect the changes made and its effect on the revenue requirement?

A. Yes. Staff has prepared schedules REL-1 for each system which show Staff's direct testimony and its surrebuttal position and the effect of Staff's surrebuttal adjustments on the revenue requirement.

Working Capital Allowance

Q. Did the Company take exception to Staff's lead/lag adjustment to property taxes?

A. Yes. The Company disagreed with the lag-day factor used by Staff to calculate the Cash Working Capital component related to property taxes.

The Company used 212 lag days while Staff used 592 lag days to arrive at its proposed adjustments. Actually, both figures are incorrect. In order to determine the correct lag days Staff obtained a January 7, 1997, memo from the Arizona Department of Revenue. This memo describes the change brought about by the new law, which states that the valuation year will precede the tax year. The memo includes a calendar which shows that the lag created by this new law totals 532.5 days. This memo is attached as Surrebuttal Exhibit REL-2. Staff has adjusted its Cash Working Capital figure accordingly.

Q. Does Staff agree with the Company's characterization that Staff used expense amounts and expense lag days for each individual system to mean the Company did not use the individual approach?

A. No. Staff simply stated how it completred its analysis and should not have been interpreted by the Company in any other context.

Q. Does Staff agree with the Company's assertion that depreciation expenses and deferred inc me taxes were not included in its calculations?

A. No. The Company removed depreciation expense and deferred income taxes from the expense lag days but did not remove them from its calculation of revenue days. It is improper to include the deprecation expense and deferred tax figures in the revenue side of the equation but remove them from the expense side. This mismatch results in an overstatement of Cash Working Capital and the Company's calculations are not accurate.

Q. Did Staff's lead/lag study incorporate all its adjustments to operating expenses?

A. No. Staff incorporated those adjustments it felt were material such as property taxes and synchronized interest. However, since rebuttal and surrebuttal testimonies can draw the parties closer to a consensus, Staff has also adjusted its Federal and state income tax as well as its property tax and rate base figures and recalculated its Cash Working Capital allowance accordingly.

Deferred CAP Charges

Q. Did the Company raise concerns about the number of years Staff used to amortize the deferred CAP balance?

A. Yes. The Company raised two concerns: First, the Company indicated that it could not determine whether Staff amortized the deferred CAP balance over 32 or 34 years

(Hubbard, Rebuttal at 12, line 4.) Second, the Company disagreed with Staff's recommendation to amortize the deferred CAP balance over the remaining life of the CAP contract because it "extends well beyond the periods of time authorized by the Commission for recovery of these same deferred charges by other water utilities . . ." (Garfield, Rebuttal, at 4, line 10).

Q. What is Staff's recommended amortization period?

A. Staff's recommended amortization period is 32 years or 384 months. This number is shown in Staff's direct testimony on Schedule REL 14, Line 12.

Q. Please explain why Staff recommended an amortization period of 32 years.

A. In Decision No. 58120, dated December 23, 1992, the Commission ordered Arizona Water Company to amortize the $60,000 in deferred CAP-Municipal and Industrial ("M&I") charges (that were accrued in the 1990 test year and prior years) over 44 years (i.e., the remaining life of the contract). This method is consistent with Generally Accepted Accounting Principles ("GAAP") which requires that all deferred charges be amortized over the estimated benefit period.

In addition, the Company provided an amortization schedule of its $60,000 deferred CAP M&I charges in response to Staff's data request REL 7-6. The schedule shows 43 annual amortization expense periods of $1,380 beginning in the year 1993 and one final expense amount of $660 ending in the year 2036, for total payments of $60,000 ($1,380 x $43 + $660) amortized over 44 years.

Q. Does Staff believe the Company's proposed amortization period of three years is appropriate?

A. No, it does not. A three-year amortization period is not in the public interest nor is it consistent with Decision No. 58120, or the Company's present method of amortizing its deferred CAP balance over the remaining life of the CAP contract. Additionally, a three-year period is not consistent with GAAP.

Revenue Annualization

Q. Did the Company accept Staff's pro forma adjustment to increase revenue annualization?

A. No it did not. The Company computed average cost per customer using only its 5/8-inch meter size because the majority of the growth is in the 5/8-inch meter group.

Q. Does Staff agree with the Company's argument?

A. No, it does not. The Company did not rectify the fact that in computing the corresponding expenses to the additional revenues provided by their annualization of year-end customers, they used total expenses rather than the expenses for the 5/8-inch meter group, thus creating a mismatch.

Q. What is the effect of the Company's position?

A. By using the expense annualization that includes all meter sizes the resulting operation income is understated.

Purchased Power Adjustment Mechanism

Q. Did the Company agree with Staff's proposal to eliminate the Purchased Power Adjustment Mechanism ("PPAM")?

A. No, although Arizona Water is the only water provider that still uses the Purchased Pumping Power Adjustor it still believes it needs such an adjustor. Such adjustors have been used where power costs are by far the largest single cost item and are highly volatile. In the instant case, purchased power for the Eastern Group represents only 9.9 per cent of its total cost and can not be considered the Company's largest single cost item.

Q. Does the Company cite examples of other companies adjustor mechanisms?

A. Yes, the Company has chosen to use energy providers as the example of companies that maintain adjustors. This comparison is inappropriate. The companies that Arizona Water referred to are energy resellers and as such purchased fuel is by far the biggest expense in their cost of service and the price is highly volatile. Arizona Water does not meet either of these criteria.

Purchased Water Adjustor Mechanism

Q. Did the Company agree with Staff's proposal to eliminate the Purchased Water Adjustment Mechanism ("PWAM")?

A. No. The Company objected to the removal of the Purchased Water Adjustor Mechanism.

Q. How many water companies currently have a PWAM?

A. Arizona Water is the only water company with this form of adjustor and, it only applies to three of its eighteen systems. Of these, only the San Manuel and Superior systems are located in the Eastern Division. The Superior system's purchased water expense accounts for less than one percent of its total operation and maintenance expense. The Company stated that its purchased water expense is twenty-nine percent (29%) of its operation and maintenance expense for San Manuel.

Q. Does the Company have a source of production in the San Manuel system?

A. No. The Company owns no wells in its San Manual system and relies solely on water purchased form BHP Copper ("BHP").

Q. Does Arizona Water have a contract with BHP?

A. Yes. The Company entered into a ten (10) year contract in March of 1999 which has an annual adjustment clause. Since the Company has agreed to file another rate case in 2006, Staff believes its proposed rates are sufficient to provide the Company sufficient revenue to cover its purchased water expense.

Q. What is the effect of purchasing all the Company's water needs?

A. The Company has no investment in wells and is totally reliant on purchased water. With the PWAM in effect, the Company has transferred its risk of providing water to its ratepayers rather than its shareholder where such risk properly belongs. The Commission should eliminate the PWAM.

Capital and Delivery Charges

Q. Did the Company propose any changes to its CAP Purchased Water Expense?

A. Yes. In its rebuttal testimony (Hubbard at 22, lines 4 - 21) the Company proposes to use CAP contract rates that will go into effect in the year 2004.

Q. Given that the Company's test year is 2001, does Staff believe it is appropriate to use contract rates that become effective in the year 2004?

A. No, Staff does not believe that it is appropriate to use 2004 expenses.

Q. Please explain why it is inappropriate to use 2004 expenses?

A. CAP 2004 expenses are inappropriate because they go too far beyond the 2001 test year.

CAP Purchased Water Expense, Annualization Adjustment

Q. The Company expressed a concern that Staff understated its purchased water expense by $31,604 (Rebuttal, Hubbard, at 31, line 4). Does Staff agree with the Company's concern?

A. Staff does not agree that its recommended purchased water expense is understated; however, Staff does agree that the number should be revised.

Q. Please state Staff's revised purchased water expense amount?

A. Staff's revised purchased water expense amount is $965,689. This amount is $9,367 less than the $975,056 recommended in Staff's direct testimony.

Q. Please discuss the revisions made to Staff's recommended purchased water expense calculation?

A. Staff made three changes to the purchased water expense calculation in order to show the consistency between Schedules REL-13 and REL-15.

First, Staff reduced its recommended amount of CAP purchased water expense (shown on line 1 of Schedule REL-13) by $25,188, from $728,497 in its direct testimony to $703,309 in order to reflect the 2001 purchased water expense. Second, Staff re-instated the Company's $10,982 pro forma adjustment (shown on line 5 of Schedule REL-13); increasing it by $10,982, from $0 in Staff's direct testimony to $10,982 to reflect an additional month of M&I capital cost that was not included in the 2001 purchased water expense of $703,309. Third, Staff reflected the 2001 M&I costs (shown on line 6 of Schedule REL-13), increasing the amount by $4,839, from $109,100 in Staff's direct testimony to $113,939. These three revisions result in a net decrease of $9,367 from Staff's direct testimony (i.e. [$25,188] +$10,982 + $4,839 = [$9,367]).

Rate Case Expense

Q. Does the Company disagree with Staff's analysis of its requested rate case Expenses?

A. Yes. The Company disagrees with Staff's Recommendation.

Q. Did the Company increase its requested rate case expense in its Rebuttal Testimony?

A. Yes. The Company is requesting an additional unknown amount in its rebuttal testimony that includes legal expenses regarding the Arsenic Cost Recovery Mechanism ("ACRM"), Phase Two of the Northern Group. Staff recommends that legal expenses from the Northern Group not be included in Eastern Group rates.

Q. Did Staff compare the rate case expense level incurred in 1990 with the cost of the instant case?

A. Yes, Staff did compare the two expense levels and found this case's expenses to be excessive. However, according to the Company, they should not be compared because in the 1990 proceeding the Company did not retain the services of outside consultants. Staff believes that while use of outside consultants is appropriate in many instances, the outside consultant expenses in this case are unnecessarily costly and shareholders should bear some of that additional cost.

CIAC Amortization Rate

Q. Did the Company express any concerns regarding Staff's Contributions in Aid of Construction ("CIAC") amortization?

A. Yes. The Company disagrees with the 2.34 per cent CIAC amortization rate used by Staff. (Rebuttal, Hubbard at 26, lines 25, 26 and at 27 lines 1-4.) Staff's rate was determined consistent with the methodology used in the Company's 1990 rate case and its Northern Group's 1999 rate case. Staff calculates the composite depreciation rate by dividing each depreciation expense by its depreciable plant. In Staff's Data Request REL-1-9, the Company was asked to explain "The calculations used to determine CIAC amortization rates" and responded that "the CIAC amortization rate is based on the composite depreciation rate. It is not calculated separately."

In its testimony, the Company to includes only the following five plant accounts in determining it CIAC amortization rate: 1) Transmission and Distribution Mains, 2) Fire Sprinkler Taps, 3) Services, 4) Meters and, 5) Hydrants.

If the Company had wished to deviate from the method used in its last two rate cases it then should have requested such a change in its application and not in its rebuttal testimony. This would have given Staff the opportunity to review this change.

Pinal Creek Group Issue

Q. Has the Company expressed concern regarding Staff's handling of the Pinal Creek Group ("PCG") matter?

A. Yes it has. Both Mr. Garfield and Mr. Kennedy have addressed the benefits their Miami customers have received as a result of the Company's efforts.

Q. Are the benefits discussed the result of the efforts in the Pinal Creek Settlement?

A. The benefits discussed by the Company are those that a well managed Company such as Arizona Water should be seeking for itself and its customers. However, in spite of all the alleged benefits the Company secured for its customers, the Company failed to quantify them so they could be passed on to it customers.

Q. Does this conclude your surrebuttal testimony?

A. Yes. However, Staff's silence on any particular issue raised in the Company's rebuttal testimony does not necessarily indicate that Staff agrees with the Company's stated rebuttal position on the issue.

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 32,403,018	$ 33,798,525	$ 1,395,507	4.31%
2	Adjusted Operating Income (Loss)	$ 2,398,379	$ 2,425,092	$ 26,713	1.11%
3	Current Rate of Return (L2 / L1)	7.40%	7.18%	-0.23%	-3.06%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 2,775,643	$ 2,895,182	$ 119,539	4.31%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 377,263	$ 470,089	$ 92,826	24.61%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 615,676	$ 767,163	$ 151,487	24.60%
9	Adjusted Test Year Revenue	$ 14,749,327	$ 14,749,327	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 15,365,003	$ 15,516,490	$ 151,487	0.99%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	4.17%	5.20%	1.03%	24.60%

Arizona Water Company - Apache Junction
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 18,346,065	$ 19,071,140	$ 725,075	3.95%
2	Adjusted Operating Income (Loss)	$ 2,123,885	$ 2,145,383	$ 21,498	1.01%
3	Current Rate of Return (L2 / L1)	11.58%	11.25%	-0.33%	-2.85%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 1,571,524	$ 1,633,634	$ 62,110	3.95%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ (552,362)	$ (511,749)	$ 40,613	-7.35%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ (901,427)	$ (835,149)	$ 66,278	-7.35%
9	Adjusted Test Year Revenue	$ 9,038,642	$ 9,038,642	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 8,137,215	$ 8,203,493	$ 66,278	0.81%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	-9.97%	-9.24%	0.73%	-7.32%

Ari'ona Water Company - Bisbee
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 3,425,681	$ 3,590,535	$ 164,854	4.81%
2	Adjusted Operating Income (Loss)	$ 74,500	$ 75,856	$ 1,356	1.82%
3	Current Rate of Return (L2 / L1)	2.17%	2.11%	-0.06%	-2.76%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 293,444	$ 307,565	$ 14,121	4.81%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 218,944	$ 231,709	$ 12,765	5.83%
7	Gross Revenue Conversion Factor	1.63195	'.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 357,306	$ 378,139	$ 20,833	5.83%
9	Adjusted Test Year Revenue	$ 1,256,603	$ 1,256,603	$ -	0.00%
	Proposed Annual Revenue (L8 + L9)	$ 1,613,909	$ 1,634,742	$ 20,833	1.29%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	28.43%	30.09%	1.66%	5.84%

Arizona Water Company - Miami
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 2,740,612	$ 2,918,090	$ 177,478	6.48%
2	Adjusted Operating Income (Loss)	$ 121,633	$ 122,821	$ 1,188	0.98%
3	Current Rate of Return (L2 / L1)	4.44%	4.21%	-0.23%	-5.18%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 234,761	$ 249,964	$ 15,203	6.48%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 113,128	$ 127,143	$ 14,015	12.39%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 184,620	$ 207,490	$ 22,870	12.39%
9	Adjusted Test Year Revenue	$ 1,456,722	$ 1,456,722	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 1,641,342	$ 1,664,212	$ 22,870	1.39%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	12.67%	14.24%	1.57%	12.39%

Arizona Water Company - Oracle
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 2,415,268	$ 2,495,716	$ 80,448	3.33%
2	Adjusted Operating Income (Loss)	$ 159,660	$ 160,336	$ 676	0.42%
3	Current Rate of Return (L2 / L1)	6.61%	6.42%	-0.19%	-2.87%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 206,892	$ 213,783	$ 6,891	3.33%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 47,232	$ 53,447	$ 6,215	13.16%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 77,081	$ 87,224	$ 10,143	13.16%
9	Adjusted Test Year Revenue	$ 828,768	$ 828,768	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 905,849	$ 915,992	$ 10,143	1.12%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	9.30%	10.52%	1.22%	13.12%

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 641,450	$ 699,272	$ 57,822	9.01%
2	Adjusted Operating Income (Loss)	$ (157,939)	$ (157,490)	$ 449	-0.28%
3	Current Rate of Return (L2 / L1)	-24.62%	-22.52%	2.10%	-8.53%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 54,947	$ 59,900	$ 4,953	9.01%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 212,886	$ 217,389	$ 4,503	2.12%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 347,419	$ 354,769	$ 7,350	2.12%
9	Adjusted Test Year Revenue	$ 474,116	$ 474,116	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 821,535	$ 828,885	$ 7,350	0.89%
11	Require increase/Decrease in Revenue (%) (L8/L9)	73.28%	74.83%	1.55%	2.12%

Arizona Water Company - Sierra Vista
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 2,200,445	$ 2,317,537	$ 117,092	5.32%
2	Adjusted Operating Income (Loss)	$ 60,968	$ 61,973	$ 1,005	1.65%
3	Current Rate of Return (L2 / L1)	2.77%	2.67%	-0.10%	-3.61%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 188,490	$ 198,520	$ 10,030	5.32%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 127,522	$ 136,547	$ 9,025	7.08%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 208,109	$ 222,838	$ 14,729	7.08%
9	Adjusted Test Year Revenue	$ 897,163	$ 897,163	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 1,105,272	$ 1,120,001	$ 14,729	1.33%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	23.20%	24.84%	1.64%	7.07%

Arizona Water Company - Superior
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 2,400,573	$ 2,463,731	$ 63,158	2.63%
2	Adjusted Operating Income (Loss)	$ 6,097	$ 6,585	$ 488	8.00%
3	Current Rate of Return (L2 / L1)	0.25%	0.27%	0.02%	8.00%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 205,633	$ 211,043	$ 5,410	2.63%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 199,536	$ 204,458	$ 4,922	2.47%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 325,633	$ 333,665	$ 8,032	2.47%
9	Adjusted Test Year Revenue	$ 698,589	$ 698,589	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 1,024,222	$ 1,032,254	$ 8,032	0.78%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	46.61%	47.76%	1.15%	2.47%

Arizona Water Company - Winkelman
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

REVENUE REQUIREMENT

LINE NO.	DESCRIPTION	Direct Testimony	Surrebuttal	Variance to Direct Testimony	% Variance
1	Adjusted Rate Base	$ 232,924	$ 242,504	$ 9,580	4.11%
2	Adjusted Operating Income (Loss)	$ 9,575	$ 9,628	$ 53	0.55%
3	Current Rate of Return (L2 / L1)	4.11%	3.97%	-0.14%	-3.41%
4	Required Rate of Return	8.5660%	8.5660%	0.00%	0.00%
5	Required Operating Income (L4 * L1)	$ 19,952	$ 20,773	$ 821	4.11%
6	Operating Income Deficiency/Suficiency (L5 - L2)	$ 10,377	$ 11,145	$ 768	7.40%
7	Gross Revenue Conversion Factor	1.63195	1.63195	-	0.00%
8	Increase/Decrease In Gross Revenue (L7 * L6)	$ 16,935	$ 18,187	$ 1,252	7.39%
9	Adjusted Test Year Revenue	$ 98,724	$ 98,724	$ -	0.00%
10	Proposed Annual Revenue (L8 + L9)	$ 115,659	$ 116,911	$ 1,252	1.08%
11	Require Increase/Decrease in Revenue (%) (L8/L9)	17.15%	18.42%	1.27%	7.41%

ARIZONA DEPARTMENT OF REVENUE

1600 WEST MONROE - PHOENIX, ARIZONA 85007-2650

January 7, 1997

FIFE SYMINGTON
GOVERNOR

MARK W. KILLIAN
DIRECTOR

NOTICE TO ALL TAXPAYERS WHOSE PROPERTY IS VALUED BY THE DEPARTMENT OF REVENUE

The1996 Arizona Legislature passed House Bill 2007 modifying the assessment and appeals calendar for taxpayers whose property is valued by the Department of Revenue for property tax purposes (i.e., utilities, mines, railroads, pipelines, airlines, and telecommunications companies). This bill changed the date by which the Department (DOR) must determine values and the appeals calendar pertaining to those properties. **The new law requires that full cash values established in 1997 will be used for property tax purposes in tax years 1997 and 1998, in order to permit the transition to the new calendar.**

The new calendar will not take effect until 1998; the assessment and appeals calendar is unchanged for the 1997 (current) calendar year. The following is a comparison of the significant dates in the two calendars:

	Current Calendar	New Calendar
Calendar Year	1997	1998
Valuation Date	Jan. 1, 1997	Jan. 1, 1998
Annual taxpayer reports due to the DOR	April 1	April 1
DOR notifies taxpayers of value	May 3	June 15
Deadline for appeals to DOR	May 20	July 15
Deadline for DOR to rule on appeals	June 16	August 31
Deadline for appeals to State Board of Equalization	June 23*	October 1
Deadline for State Board of Equalization to rule on appeals	July 31	November 15
Tax Year(s)	1997 & 1998	1999
Due date for first half of taxes for tax year(s)	October 1 (1997 & 1998)	October 1 (1999)
Due date for second half of taxes for tax year(s)	March 1 (1998 & 1999)	March 1 (2000)

*Or 15 days after the DOR mails its decision, whichever is later.

The most significant change brought about by the new law is that the valuation year will precede the tax year. The "valuation date" will continue to be January 1 of the valuation year. For example, the valuation date for values established during calendar year 1998 will be January 1, 1998, but those values will not be used for property tax purposes until the 1999 tax year.

Assessed values for Class one and two properties (utilities, local telecommunication companies, pipelines, and mines) will be lower in 1998 as the assessment ratio for those properties continues to drop. The 1997 assessment ratio will be 27% and the 1998 assessment ratio will be 26%. Therefore, if the 1997 full cash value is $1,000,000, the 1997 assessed value will be $270,000 and the 1998 assessed value will be $260,000.

Should you have any questions, please feel free to call either Susan Husi, or Cheryl Murray Leyba at 602-542-3529.

Centrally Valued Property Calendar
2003 Calendar (Valuation) Year
(2004 Tax Year)

January 1	Valuation date for 2004 tax year; lien date for 2003 tax year.
March 1	Due date for second half of property taxes for the <u>2002 tax year</u> (except private car companies). Delinquent after May 1 at 5:00 p.m.
March 20	Deadline for requests for extension of time for filing property tax reporting forms.
April 1	Property tax reporting forms due to the Department of Revenue.
May 20	Right of appeal of the valuation and classification forfeited if property tax reporting forms not filed by this date (for companies operating in air commerce; producing and closed mines, mills and smelters; oil, gas and geothermal resource interests; gas, water, sewer and wastewater, and electric utilities and pipelines).
June 15	The Department notifies taxpayers of preliminary value of their property in Arizona.
July 15	Deadline for property owner to request an informal conference with the Department (first level of appeal).
July 21 - August 14	Informal conferences held with taxpayers dissatisfied with the Department's valuations.
August 31	Deadline for the Department to rule on appeals presented at informal conferences. Final Notices of Value mailed (for those taxpayers whose value has changed from the Preliminary Notice).
October 1	Deadline for appeals to the State Board of Equalization.
October 1	Due date for first half of property taxes for <u>2003 tax year</u>. Delinquent after November 1 at 5:00 p.m.
November 15	Deadline for State Board of Equalization to rule on appeals. An appeal from State Board of Equalization's decision to court must be filed within sixty days after the date of the State Board's final decision.
Dec. 15th	Deadline for appeal of Department's valuation directly to the superior court.

2004 Calendar Year

March 1	Due date for second half of property taxes for the <u>2003 tax year</u>. Delinquent after May 1 at 5:00 p.m.
October 1	Due date for first half of property taxes for <u>2004 tax year</u>. Delinquent after November 1 at 5:00 p.m.

2005 Calendar Year

March 1	Due date for second half of property taxes for the <u>2004 tax year</u>. Delinquent after May 1 at 5:00 p.m.

ARIZONA WATER COMPANY - APACHE JUNCTION
DOCKET NO. W-0144 A-02-0619
TEST YEAR ENDED DECEMBER 31, 2001

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
Monthly Usage Charge:	Rates	Company	Dir. Testimony	Surrebuttal
5/8" x 3/4" Meter	$ 12.43	$ 18.13	$ 12.43	$ 12.43
1" Meter	$ 24.86	$ 40.79	$ 35.71	$ 35.71
2" Meter	$ 62.15	$ 117.85	$ 113.80	$ 113.80
3" Meter	$ 103.58	$ 211.58	$ 283.79	$ 283.79
4" Meter	$ 207.16	$ 377.65	$ 532.97	$ 532.97
6" Meter	$ 362.53	$ 717.59	$ 717.50	$ 717.50
8" Meter	$ 362.53	$ 989.54	$ 862.25	$ 862.25
10" Meter	$ 673.27	$ 1,624.09	$ 1,003.50	$ 1,003.50
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 2.5690	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 2.5690	$ 2.5250	$ 1.5008	$ 1.5248
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 2.5690	$ 2.5250	$ 1.8760	$ 1.9060
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 2.5690	$ 2.5250	$ 2.2512	$ 2.2872
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

ARIZONA WATER COMPANY - APACHE JUNCTION
DOCKET NO. W-01445A-02-0619
TEST YEAR ENDED DECEMBER 31, 2001

RATE DESIGN
CONTINUED

	Present	---Proposed Rates---		
			Staff	
Service Charges:	Rates	Company	Dir. Testimony	Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	(c)	(c)	(c)	(c)
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	(d)	(d)	(d)	(d)
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ 10.00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	(e)	(e)	(e)

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

Arizona Water Company - Bisbee
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
Monthly Usage Charge:	Rates	Company	Dir. Testimony	Surrebuttal
5/8" x 3/4" Meter	$ 13.47	$ 20.11	$ 15.87	$ 15.87
1" Meter	$ 24.86	$ 43.64	$ 41.50	$ 41.50
2" Meter	$ 62.15	$ 126.89	$ 133.27	$ 133.27
3" Meter	$ 155.37	$ 266.86	$ 267.25	$ 267.25
4" Meter	$ 207.16	$ 406.02	$ 449.50	$ 449.50
6" Meter	$ [illegible]2.53	$ 773.43	$ 662.53	$ 662.53
8" Meter	$ 362.53	$ 1,075.08	$ 891.27	$ 891.27
10" Meter	$ 673.27	$ 1,759.42	$ 1,200.36	$ 1,200.36
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 2.4860	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 2.4860	$ 3.1600	$ 2.3696	$ 2.4280
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 2.4860	$ 3.1600	$ 2.9620	$ 3.0350
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 2.4860	$ 3.1600	$ 3.5544	$ 3.6420
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

Arizona Water Company - Bisbee
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN
CONTINUED

	Present	---Proposed Rates---		
			Staff	
Service Charges:	Rates	Company	Dir. Testimony	Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	(c)	(c)	(c)	(c)
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	(d)	(d)	(d)	(d)
Serv[illegible]e Call Out (After Regu[illegible] Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ [illegible].00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	(e)	(e)	(e)

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

Arizona Water Company - Miami
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
Monthly Usage Charge:	Rates	Company	Dir. Testimony	Surrebuttal
5/8" x 3/4" Meter	$ 13.47	$ 20.22	$ 16.36	$ 16.36
1" Meter	$ 24.86	$ 43.88	$ 36.80	$ 36.80
2" Meter	$ 62.15	$ 127.59	$ 123.96	$ 123.96
3" Meter	$ 103.58	$ 229.29	$ 238.19	$ 238.19
4" Meter	$ 207.16	$ 408.24	$ 511.03	$ 511.03
6" Meter	$ 362.53	$ 777.66	$ 1,006.31	$ 1,006.31
8" Meter	$ 362.53	$ 1,080.96	$ 1,163.12	$ 1,163.12
10" Meter	$ 673.27	$ 1,769.05	$ 1,305.25	$ 1,305.25
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 3.3040	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 3.3040	$ 4.3300	$ 2.4584	$ 2.5184
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 3.3040	$ 4.3300	$ 3.0730	$ 3.1480
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 3.3040	$ 4.3300	$ 3.6876	$ 3.7776
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

Arizona Water Company - Miami
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN
CONTINUED

	Present	---Proposed Rates---		
			Staff	
Service Charges:	Rates	Company	Dir. Testimony	Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	(c)	(c)	(c)	(c)
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	(d)	(d)	(d)	(d)
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ 10.00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	(e)	(e)	(e)

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

Arizona Water Company - Oracle
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
	Rates	Company	Dir. Testimony	Surrebuttal
Monthly Usage Charge:				
5/8" x 3/4" Meter	$ 15.54	$ 20.05	$ 18.75	$ 18.75
1" Meter	$ 38.84	$ 50.13	$ 38.63	$ 38.63
2" Meter	$ 103.58	$ 146.97	$ 181.73	$ 181.73
3" Meter	$ 155.37	$ 250.63	$ 220.51	$ 220.51
4" Meter	$ 207.16	$ 384.36	$ 286.45	$ 286.45
6" Meter	$ 492.01	$ 818.64	$ 335.79	$ 335.79
8" Meter	$ 621.48	$ 1,203.00	$ 625.36	$ 625.36
10" Meter	$ 673.27	$ 1,687.41	$ 837.19	$ 837.19
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 5.7490	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 5.7490	$ 6.2980	$ 4.4640	$ 4.5460
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 5.7490	$ 6.2980	$ 5.5800	$ 5.6820
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 5.7490	$ 6.2980	$ 6.6960	$ 6.8180
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

Arizona Water Company - Oracle
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN
CONTINUED

	Present	---Proposed Rates---		
			Staff	
Service Charges:	Rates	Company	Dir. Testimony	Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	(c)	(c)	(c)	(c)
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	(d)	(d)	(d)	(d)
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ 10.00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	(e)	(e)	(e)

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

Arizona Water Compa..y - San Manuel
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

Schedule REL-23
Page 1 of 2

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
Monthly Usage Charge:	Rates	Company	Dir. Testimon	Surrebuttal
5/8" x 3/4" Meter	$ 13.98	$ 27.47	$ 19.26	$ 19.26
1" Meter	$ 31.07	$ 64.83	$ 41.60	$ 41.60
2" Meter	$ 93.22	$ 201.36	$ 183.76	$ 183.76
3" Meter	$ 155.37	$ 358.76	$ 212.35	$ 212.35
4" Meter	$ 269.31	$ 607.91	$ 443.74	$ 443.74
6" Meter	$ 362.53	$ 1,043.04	$ 526.78	$ 526.78
8" Meter	$ 362.53	$ 1,455.09	$ 854.56	$ 854.56
10" Meter	$ 673.27	$ 2,378.35	$ 1,228.50	$ 1,228.50
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 0.9220	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 0.9220	$ 1.6220	$ 1.3600	$ 1.3930
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 0.9220	$ 1.6220	$ 1.7000	$ 1.7410
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 0.9220	$ 1.6220	$ 2.0400	$ 2.0890
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

Arizona Water Company - San Manuel
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

Schedule REL-23
Page 2 of 2

RATE DESIGN
CONTINUED

	Present	---Proposed Rates---		
			Staff	
Service Charges:	Rates	Company	Dir. Testimon	Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	**(c)**	**(c)**	**(c)**	**(c)**
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	**(d)**	**(d)**	**(d)**	**(d)**
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ 10.00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 20.00	$ 20.00	$ 20.00	$ 20.00
Late Charge	N/A	**(e)**	**(e)**	**(e)**

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

Arizona Water Company - Sierra Vista
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

Schedule REL-21
Page 2 of 2

RATE DESIGN
CONTINUED

Service Charges:	Present Rates	---Proposed Rates--- Company	Staff Dir. Testimony	Staff Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	(c)	(c)	(c)	(c)
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	(d)	(d)	(d)	(d)
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ .00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	(e)	(e)	(e)

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

Arizona Water Company - Sierra Vista
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

Schedule REL-21
Page 1 of 2

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
	Rates	Company	Dir. Testimony	Surrebuttal
Monthly Usage Charge:				
5/8" x 3/4" Meter	$ 12.43	$ 18.25	$ 16.20	$ 16.20
1" Meter	$ 24.86	$ 41.06	$ 33.01	$ 33.01
2" Meter	$ 62.15	$ 118.63	$ 154.12	$ 154.12
3" Meter	$ 103.58	$ 212.98	$ 296.19	$ 296.19
4" Meter	$ 207.16	$ 380.15	$ 419.16	$ 419.16
6" Meter	$ 362.53	$ 722.34	$ 604.72	$ 604.72
8" Meter	$ [illegible]2.53	$ 996.09	$ 725.66	$ 725.66
10" Meter	$ 673.27	$ 1,634.84	$ 907.08	$ 907.08
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 1.5950	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 1.5950	$ 2.1130	$ 1.3580	$ 1.3940
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 1.5950	$ 2.1130	$ 1.6980	$ 1.7420
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 1.5950	$ 2.1130	$ 2.0380	$ 2.0900
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.

(b) Full cost for 2"and larger if on existing or new pipelines.

Arizona Water Company - Superior
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
Monthly Usage Charge:	Rates	Company	Dir. Testimony	Surrebuttal
5/8" x 3/4" Meter	$ 18.13	$ 18.13	$ 20.05	$ 20.05
1" Meter	$ 38.84	$ 40.79	$ 70.20	$ 70.20
2" Meter	$ 103.58	$ 117.85	$ 150.26	$ 150.26
3" Meter	$ 155.37	$ 211.58	$ 432.93	$ 432.93
4" Meter	$ 207.16	$ 377.65	$ 519.52	$ 519.52
6" Meter	$ 362.53	$ 717.59	$ 623.42	$ 623.42
8" Meter	$ 362.53	$ 989.54	$ 748.10	$ 748.10
10" Meter	$ 673.27	$ 1,624.09	$ 935.13	$ 935.13
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 4.0600	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 4.0600	$ 4.0600	$ 5.1040	$ 5.1640
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 4.0600	$ 4.0600	$ 6.3800	$ 6.4550
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 4.0600	$ 4.0600	$ 7.6560	$ 7.7460
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

Arizona Water Company - Superior
Docket No. W-01445A-02-0619
Test Year Ended December 31, 2001

Schedule REL-21
Page 2 of 2

RATE DESIGN
CONTINUED

	Present	---Proposed Rates---		
			Staff	
Service Charges:	Rates	Company	Dir. Testimony	Surrebuttal
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	**(c)**	**(c)**	**(c)**	**(c)**
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	**(d)**	**(d)**	**(d)**	**(d)**
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ 10.00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	**(e)**	**(e)**	**(e)**

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

ARIZONA WATER COMPANY - WINKELMAN
DOCKET NO. W-01445A-02-0619
TEST YEAR ENDED DECEMBER 31, 2001

Schedule REL-22
Page 1 of 2

RATE DESIGN

	Minimum Monthly Usage Charge			
	Present	---Proposed Rates---		
			Staff	
Monthly Usage Charge:	Rates	Company	Dir. Testimony	Surrebuttal
5/8" x 3/4" Meter	$ 12.95	$ 17.30	$ 12.95	$ 12.95
1" Meter	$ 24.86	$ 38.23	$ 39.66	$ 39.66
2" Meter	$ 62.15	$ 110.72	$ 57.90	$ 57.90
3" Meter	$ 103.58	$ 198.95	$ 227.22	$ 227.22
4" Meter	$ 207.16	$ 354.65	$ 494.41	$ 494.41
6" Meter	$ 362.53	$ 674.70	$ 616.16	$ 616.16
8" Meter	$ 362.53	$ 934.20	$ 764.18	$ 764.18
10" Meter	$ 673.27	$ 1,530.88	$ 935.02	$ 935.02
Gallons Included In Minimum Charge:				
5/8" x 3/4" Meter	1,000	0	0	0
1" Meter	1,000	0	0	0
2" Meter	1,000	0	0	0
3" Meter	1,000	0	0	0
4" Meter	1,000	0	0	0
6" Meter	1,000	0	0	0
8" Meter	1,000	0	0	0
10" Meter	1,000	0	0	0
Fire Hydrants Used For Construction Water	1,000	0	0	0
Commodity Rates :				
Per 1,000 Gallons (In Excess of Minimum)	$ 1.2330	N/A	N/A	N/A
Per 1,000 Gallons for 0 to 3,000 Gallons	$ 1.2330	$ 1.4910	$ 1.0240	$ 1.0400
Per 1,000 Gallons for 3,001 to 50,000 Gallons	$ 1.2330	$ 1.4910	$ 1.2800	$ 1.3000
Per 1,000 Gallons for Gallons in Excess of 50,000	$ 1.2330	$ 1.4910	$ 1.5360	$ 1.5600
Service Line and Meter Installation Charge:				
5/8" x 3/4" Meter	(a)	(a)	(a)	(a)
1" Meter	(a)	(a)	(a)	(a)
2" Meter	(b)	(b)	(b)	(b)
3" Meter	(b)	(b)	(b)	(b)
4" Meter	(b)	(b)	(b)	(b)
6" Meter	(b)	(b)	(b)	(b)

(a) No charge for 5/8" and 1" if on existing pipelines. Full cost for 5/8" and 1" if if on new pipelines.
(b) Full cost for 2"and larger if on existing or new pipelines.

ARIZONA WATER COMPANY - WINKELMAN
DOCKET NO. W-01445A-02-0619
TEST YEAR ENDED DECEMBER 31, 2001

Schedule REL-22
Page 2 of 2

RATE DESIGN
CONTINUED

	Present Rates	---Proposed Rates--- Company	Staff Dir. Testimony	Staff Surrebuttal
Service Charges:				
Establishment	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Guarantee Deposit	(c)	(c)	(c)	(c)
Reconnection for Delinquency (per disconnection)	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Re-establishement	(d)	(d)	(d)	(d)
Service Call Out (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Returned Check Charge	$ 10.00	$ 25.00	$ 25.00	$ 25.00
Meter Re-read (After Regular Working Hours Only)	$ 35.00	$ 35.00	$ 35.00	$ 35.00
Meter Test	$ 50.00	$ 50.00	$ 50.00	$ 50.00
Late Charge	N/A	(e)	(e)	(e)

(c) Per Commission Rule A.A.C. R14-2-403B
(d) Eight (8) times the customer's monthly minimum charge,
or payment of the minimums since disconnection, whichever is less.
N/A No current tariff.
(e) 1.5 percent after 15 days

BEFORE THE ARIZONA CORPORATION COMMISSION

MARC SPITZER
Chairman
JIM IRVIN
Commissioner
WILLIAM A. MUNDELL
Commissioner
JEFF HATCH-MILLER
Commissioner
MIKE GLEASON
Commissioner

IN THE MATTER OF THE APPLICATION OF)
ARIZONA WATER COMPANY, AN ARIZONA)
CORPORATION, FOR ADJUSTMENTS TO ITS)
RATES AND CHARGES FOR UTILITY)
SERVICE FURNISHED BY ITS EASTERN)
GROUP AND FOR CERTAIN RELATED)
APPROVALS)

DOCKET NO. W-01445A-02-0619

SURREBUTTAL

TESTIMONY

OF

LYNDON R. HAMMON

UTILITIES CONSULTANT

UTILITIES DIVISION

SEPTEMBER 03, 2003

TABLE OF CONTENTS

Page

I. Introduction....1

II. Non-Account Water....1

III. Tariff For Non-Potable Central Arizona Project Water....2

IV. Curtailment Tariff....3

V. Miami Power Adjustment....3

AWWA Committee Report....Exhibit A

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Lyndon R. Hammon. My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Are you the same Lyndon R. Hammon who has previously filed testimony in this Arizona Water Company rate proceeding?

A. Yes. I filed direct testimony on July 08, 2003.

Q. Do you wish to make any additions, or corrections to that testimony at this time?

A. Yes.

Q. What are those additions or corrections?

A. The additions comprise responses to the Company's Rebuttal Testimony. My responses specifically address the following issues: (1) non-account water, (2) the tariff for non-potable Central Arizona Project water NP-260, (3) the curtailment tariff, and (4) the Miami power adjustment.

II. NON-ACCOUNT WATER

Q. Of course you disagree with the Company's position concerning "Water Loss" in its rebuttal testimony.

A. To the contrary, I generally agree with the Company's presentation. Hopefully, this opportunity can be used to expand and clarify the Staff's position on the non-account water issue for Arizona Water Company.

First of all, and I can not say this strongly enough, the 10 percent lost water value was never meant to be an absolute measure. Instead, it was meant to be used as an indicator or signal of the need to examine water losses more closely. Certainly a water loss value derived from gross water pumped and water sold is subject in some degree to the limitations and flaws presented in Mr. Garfield's rebuttal testimony. However, this type of calculation does provide a number which is consistent, reliable, and readily calculated from information that most utilities record. Too high of a non-account water number should trigger a water audit and evaluation.

In this case, the Company avows that it has already implemented a water loss and conservation program, including such activities as tracking monthly losses, evaluating the cost and benefits of making water loss reductions, and replacing meters at an economically optimum interval. All that Staff is requesting is that the Company quantify, compile, and present the pertinent information. As the record stands today, the Company has yet to identify the sources of the water losses or the specific corrective actions.

Q. Are the 10 percent and 15 percent gross water loss values arbitrary?

A. These are values which have long been used as guideposts within the water industry. A copy of the article, "Committee Report: Water Accountability", published in the Journal of the American Water Works Association, discusses these water loss standards, and is attached as Exhibit A. I can also add that a 10 percent water loss is a measure applied by the Arizona Department of Water Resources in its 3rd management plans. It is not my answer that these specific values, and the way they are calculated should be strictly applied to each of the Company's water systems. Instead, my point is that the 10 percent and 15 percent values for water losses are not new or unusual.

III. TARIFF FOR NON-POTABLE CENTRAL ARIZONA PROJECT WATER

Q. Was it your position in your direct testimony that there should be a fixed meter charge collected by the NP-260 tariff?

A. No, it was not and perhaps I could have been clearer. It was my position that the fixed rate charges for the Apache Junction system represent the fixed costs from Apache

Junction and the use of an Apache Junction fixed cost is not appropriate when the capital investment is different and contributed. Moreover, these fixed costs are embedded in the CAP Demand Charge and are already collected. I recommended elimination of the fixed meter charges.

IV. CURTAILMENT TARIFF

Q. Do you agree with the Company's position that they should not have to prepare a curtailment tariff as a result of this proceeding and it should not have to conform to Staff's model tariff?

A. I was gladdened to learn that the Company is preparing a master curtailment tariff, and the Company is free to craft that master tariff according to their specific needs. In my direct testimony, I stated that it may be necessary for the Company to modify the model tariff "...according to their specific management, operation, and design requirements." Since the Company is already working on a curtailment tariff, compliance with the 120 day schedule for completion of the curtailment tariff should not be burdensome.

V. MIAMI POWER ADJUSTMENT

Q. Do you agree with the Company's position that the Miami power adjustment was wrong and without supporting evidence?

A. The adjustment was made on the basis of actual water use data, power costs, and reasonable assumptions. Staff's calculations and work papers were given to the Company during the discovery process. The response from the Company was merely a narrative without any hard numbers. No calculations and work papers were offered.

The Company has the data and system knowledge to quantify and refine the adjustment. If the Company believes Staff's adjustment is incorrect, it should provide calculations, workpapers and hard numbers of its own for the Commission and Staff to review.

Q. Does this conclude your surrebuttal testimony?

A. Yes, it does.

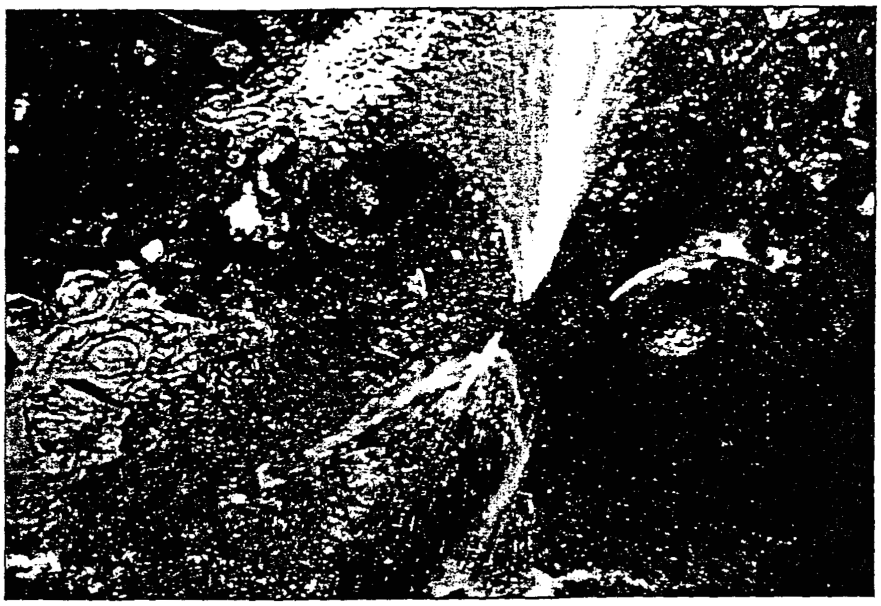
Committee report: water accountability

Advances in technologies and expertise should make it possible to reduce lost and unaccounted-for water to less than 10 percent.

AWWA Leak Detection and Water Accountability Committee

Often, decision-makers in the water supply field are satisfied when they can account for 85 percent of the water they produce. Recognizing the problem of lost or nonrevenue-producing water and desiring to find solutions for member utilities, AWWA's Distribution and Plant Operations Division asked the Leak Detection and Water Accountability Committee to write this report, which recommends that because of increasing demand and higher operational costs, the goal for lost or nonrevenue-producing water should be less than 10 percent. The report also proposes that certain guidelines should be followed when the goal of 10 percent is not met.

Over the past several years, it [illegible]l to hear statements from water [illegible]ut the country such as, "AWWA [illegible]ercent unaccounted-for water is acceptable" or "Our water loss is pretty close to the AWWA guidelines of 15 percent." In fact, AWWA has never adopted a policy or issued guidelines to the effect that 15 percent unaccounted-for water is acceptable. AWWA's Distribution and Plant Operations Division asked the National Committee on Leak Detection and Water Accountability to deter-



Water lost through leaks, underregistering meters, or water theft takes a financial toll on utility operation.

mine how this impression arose, to research the issue of unaccounted-for water, and to issue guidelines and recommendations that specifically address unaccounted-for water and effective water loss management for water utilities.

1957 report identified as source of figure

Apparently, the source of the frequently heard statement that AWWA accepts a 15 percent rate of unaccounted-for water is a committee report presented at the 1957 AWWA annual conference in Atlantic City, N.J., and subsequently published in JOURNAL AWWA.[1] The committee report states that unaccounted-for water "may vary from 10 to 15 percent in a well operated system where the consumption is between 100 and 125 gpcd [379 and 473 L/d]. Good performance is generally indicated by a metered ratio of 85–90 percent (unaccounted-for water of 10–15 percent) where the use of water is between 100 and 125 gpcd [379 and 473 L/d]." Since that article was published 39 years ago, two areas of water loss management—operating costs and technological resources—have undergone dramatic changes.

Operating costs increase. Virtually all costs of producing and distributing potable water have increased dramatically over the past 30 to 40 years—treatment plant expansions and improvements, development of additional water supplies, distribution system construction, energy charges (pumping costs), labor at all staff levels, regulatory compliance, restoration expenses, and so on. As the total cost of operation rises, the cost of unaccounted-for water also rises at a corresponding rate.

Technology developed to reduce water loss. Because of increasing costs of production, distribution, and unaccounted-for water, many technological advances aimed at reducing water loss have been developed. These include leak detection and pinpointing instruments, more accurate metering devices, instrumentation to test meter accuracy, rate-of-flow recording for meter sizing and typing, and data collection. In addition, a wide range of techniques and methodologies provide practical application of these advanced technologies to identify losses within a water system and to implement cost-effective corrective action.

Because of these significant advances, AWWA's Leak Detection and Water Accountability Committee recommends the goal for unaccounted-for water should be less than 10 percent.

Method given to determine "true" unaccounted-for water

The basic steps for quantifying the amount of water loss within a water system are as follows:

Regardless of the water system's size, water loss should be expressed in terms of actual volume, not as a percentage.

(1) Accurately determine the amount of water being produced or purchased and delivered to the distribution system for a 13-month period of operation. The production quantities are used to establish the base number against which all other calculations in the water accountability process will be made. It is therefore imperative that the production quantities be accurate. This requires annual accuracy testing of source meters.

(2) Determine the total amount of water sales for the same period of operation as measured by all meters in the system. This includes estimated accounts.

(3) Subtract the total amount of water sold from the total amount of water produced or purchased.

(4) Identify and quantify all other categories of water use in the system. It is recommended that all water use in the various categories be metered, so the

water can be accurately accounted for instead of ending up in the unaccounted-for water category where it does not belong. If actual metering is not possible, every effort should be made to accurately estimate each type of water use to determine realistic usage quantities for each category.

The various categories of water use in a water system include bulk water sales (including construction), known leakage, tank (storage facility) drainage, storage tank overflows, line flushing, fire protection, bleeding or blowoff done during the winter or for taste and odor episodes, and municipal uses (sewer cleaning, street cleaning, golf course, parks and recreation facilities, hydrant flow tests, unknown miscellaneous uses, and all other nonrevenue uses).

(5) Subtract the total quantity of water use for the same period of operation for all of the identified categories in step 4 from the quantity of water remaining after step 3.

(6) The quantity of water that remains is the water system's true amount of unaccounted-for water. True unaccounted-for water consists of the following: unidentified leakage, meter inaccuracies, theft, underestimated accounts, improperly typed and sized meters, meter-reading errors, and accounting errors.

Express water loss in terms of volume

Regardless of the water system's size, water loss should be expressed in terms of actual volume, not as a percentage. This is necessary for the utility to be able to determine the true annual cost of unaccounted-for water. Consider the following example.

A water utility produces 2 mgd (7.6 ML/d) and has a true unaccounted-for water rate of 20 percent. The utility adds a large-volume user that uses 0.5 mgd (1.9 ML/d), which increases production to 2.5 mgd (9.5 ML/d). What happens to the 20 percent unaccounted-for water? It becomes 16 percent. Has the utility actually reduced its water loss and the associated costs of the loss?

Don't be misled by percentages. Measure performance with respect to unaccounted-for water strictly by comparing the volume of water lost with the volume that was lost in prior years. The "percentage unaccounted" so often used, although it is a convenient yardstick of comparison, can be misleading.

Additional Information

For additional information about leak detection and repair, consult the following AWWA or AWWA Research Foundation publications. Catalog numbers are in parentheses. To purchase copies, call the AWWA Bookstore at (303) 795-2449.

Leaks in Water Distribution Systems (20236)

Leak Detection and Water Loss Reduction (20194)

Leak Repair: After You Locate It (20022)

Introduction to Water Distribution, Vol. 3—Principals and Practices of Water Supply Operations Series (1951)

Water Audits and Leak Detection: M36 (30036)

Water and Revenue Losses: Unaccounted-for Water (90531)

Convert water loss to dollar loss

The amount of water loss is more meaningful than the percentage of unaccounted-for water. When the total volume of unsold water is known, the utility can place a value on that water and determine the cost-effectiveness of implementing corrective action.

The simplest way to estimate the potential financial loss is to make two assumptions:

- All water loss results from underground pipe leakage.
- All water loss results from underregistering water meters.

Usually the least amount of financial loss would be related to underground leakage, because that amount of the loss depends on the direct production costs associated with producing that amount of water. Three components make up direct production costs: costs of raw water, energy costs (electricity), and treatment costs (chemicals). Therefore, the total volume of underground lost water is multiplied by the unit production rate (excluding labor) to determine the approximate financial loss to the utility.

Of course, the cost of underground leakage would be of greater value if leakage repairs eliminated the need for plant expansion.

Usually the most expensive water loss in the distribution system is caused by both underregistration of water meters and theft of water. This water loss has the highest potential value because it is "sellable" at the retail water rate. The total water loss volume related to underregistration and theft should be multiplied by the retail rate to determine the approximate lost revenue.

Experience dictates that total water loss in a system does not result from one cause but from several. Generally, a utility can split the difference between financial loss from leakage and from metering. The utility could then estimate how much money is being lost because of unaccounted-for water. The actual split will vary from one utility to another and will be determined by the age of meters, water quality, system pressure, age of pipe, and pipe material. For instance, if a utility has excellent water quality (e.g., minimal buildup of sand or minerals) and an aggressive meter-maintenance program, it will tend to weigh the cost factors toward production costs rather than retail rate. An example of determining the dollar value of unaccounted-for water is:

Total daily production: 1 mgd (3.8 ML/d)

Total known usage: 0.8 mgd (3 ML/d)

Difference: 0.2 mgd (0.8 ML/d)

Production costs: $0.30/1,000 gal ($0.08/1,000 L)

Average retail rate: $2.50/1,000 gal ($0.70/1,000 L)

To determine the minimum lost revenue, multiply 0.2 mgd (0.8 ML/d) of unmetered water by the production cost. If all unmetered water was lost through leakage, the direct cost to the utility would be $21,900.

To determine the maximum amount of financial loss to the water system, multiply the 0.2 mgd (0.8 ML/d) by the retail rate; the result is $182,500 per year. If all unmetered losses occurred in the area of underregistering water meters, the financial loss attributable to that condition would be nearly nine times that of the loss attributable to leakage.

If the utility knows what is causing distribution system water losses, it may want to weigh the cost factors toward either leakage or metering. For instance, it may be determined that metering is a greater problem than leakage by a factor of 2:1. The approximate cost of lost water in the system would then be $130,000 per year. When wastewater revenue loss is added to this example, the effect on the system is amplified. For many systems, this could be a significant loss.

Weigh the costs

After the utility has determined the annual cost (or cost range) of unaccounted-for water, management can make a more informed decision concerning the cost-effectiveness of corrective action. For example, if a utility is losing $100,000 per year because of unaccounted-for water and it has an aggressive meter accuracy testing and repair program, it can be reasonably sure most of the loss is attributable to leakage. If a leak detection and pinpointing survey of the distribution system will cost about $10,000, it is likely that such a survey will be cost-effective.

Likewise, if a utility is losing $100,000 per year in unaccounted-for water and it has recently conducted a comprehensive leakage detection and pinpointing survey, it can reasonably conclude that most of the loss is attributable to meter inaccuracies or underregistration. If a testing and repair program to determine meter accuracy will cost about $20,000, it would be cost-effective.

Regardless of the size of the water utility, determining the cost of loss should be conducted on a case-by-case basis. Each water system has unique characteristics and variables that must be considered when the cost of water loss is calculated for any given system—e.g., the quantity and the quality of the raw water, the number and size of commercial and industrial meters, the extent of pumping required (energy costs), and treatment costs.

Today's water system managers are faced with a variety of challenges to be met and problems to be solved. Drought, contamination, lack of available funding sources, increased regulations for water quality and monitoring, and aging distribution systems are among some of the issues that confront water utilities.

As the cost of producing and distributing potable water continues to escalate, it will be important for water system managers to implement effective water loss management programs. Excessive amounts of water loss or unaccounted-for water will not be tolerated by regulatory agencies or the general public as water rates continue to increase.

s the total cost of operation rises, the cost of unaccounted-for water also rises at a corresponding rate.

It is fortunate that the necessary technologies, expertise, and methodologies are available to identify and substantially reduce lost water and to reduce unaccounted-for water to a more acceptable and realistic level. As the twenty-first century approaches, the goal for unaccounted-for water should be less than 10 percent.

Reference

1. Revenue-Producing Versus Unaccounted-For Water. *Jour. AWWA*, 49:12:1587 (Dec. 1957).

Bibliography

Brown, T.G. Basic Leak Detection Is Necessary for Any System. *OpFlow*, 11:10:1 (Oct. 1985).

Brown, T.G. The Tangible and Intangible Benefits of Leakage Control. Proc. 1986 AWWA Distribution System Symposium, Minneapolis, Minn.

Hock, J.G. A Comprehensive Approach to the Control of Unaccounted-For Water. Proc. 1989 AWWA Distribution System Symposium, Dallas, Texas.

Leak Detection Programs Save Water, Money; Twelve Helpful Hints For Getting Started in Leak Detection. *OpFlow*, 17:12:1 (Dec. 1991).

About the authors: *Members of the Leak Detection and Water Accountability Committee are: David A. Liston (chair), Timothy G. Brown (vice-chair), F.S. Brainard Jr., Donald E. Britt, John P. Corless Jr., Reed G. Craft, William A. Finger, John G. Hock, Chris J. Kleinert, William E. Luta, Keith J. Nelson, Glen C. Phipps, Keith Wadsworth, Dean A. Wheadon, L. Harvey Wicklund, and Glennon N. Zelch.*